COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Error Rates of 60% Quoted

'Fail-Safe' System Is Demanded As Court Told of Welfare Chaos

By a CW Staff Writer

LOS ANGELES – A joint suit filed here by welfare recipients and a taxpayer asks for the establishment of a "fail-safe" system to back up the present computerized system for handling welfare checks.

The complaint, filed last week, contends that the computer system, after a year in operation, is still producing errors 10 to 25% of the time, and that the defendants had refused to follow the advice of the manufacturer-vendor (Honeywell) as to how to reduce the error levels. As a result of the errors, it was said, one family had been evicted and others threatened with eviction, while the costs of the program to the state had been increased through the loss of federal money.

The suit was later described by County Counsel John D. Maharg as being factually and legally ill-founded, although, he said, there had been some errors in the past and that some changes were currently being made.

Only Injunction Asked

No damages are sought in the action, which includes provision for naming presently unknown people – who might well include programmers, operators, etc. It was taken under California law as a petition for a writ of mandate, that state's equivalent of the writ of mandamus. Such writs are often used to compel public officials to fulfill their duties.

The taxpayer's suit contends that a waste of money is involved and should be stopped. The emphasis here lies in the issuing of emergency grocery vouchers to recipients when their checks fail to come through on time. These grocery orders are apparently taken off later payments to the recipient as if they were cash, but cannot be charged back to the federal government because cash itself was not issued. As a result of this it appears that the County of Los Angeles has to pay more of the welfare costs than it really needs to.

User Responsible

Throughout their argument the plaintiffs take exception to the tendency of what they call "anthropomorphizing" the computer – that is regarding it as a living, intelligent object which can be blamed for making errors. They cite a few legal cases and many books which they feel show that such a viewpoint should not be acceptable. They also

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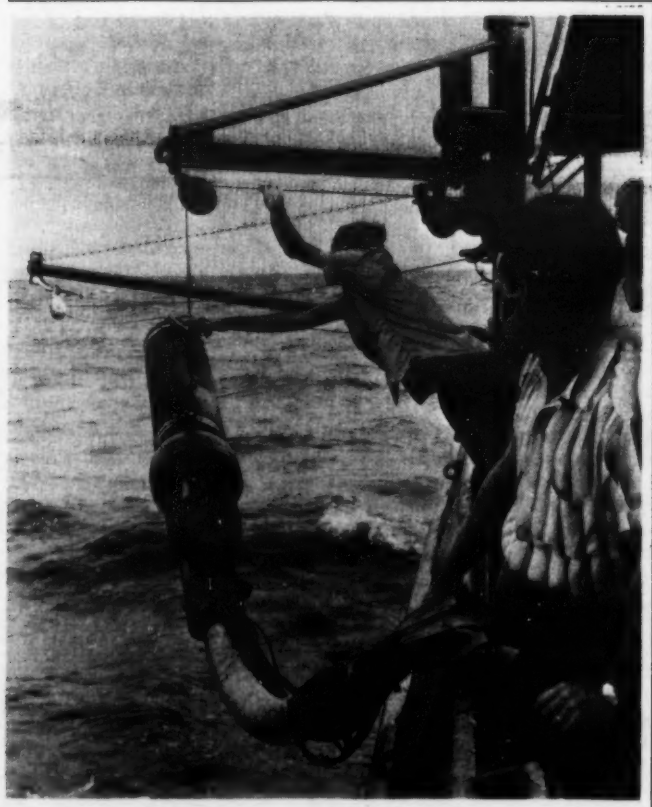

Data Collection

An Aquapulse unit, which produces sound waves and then records the echoes, is lowered into the water in a continuing search for oil deposits. The data collected is then run through a computer to determine the kind of earth layers below the ocean floor. Story on page 9.

Many States Have No Rules For Controlling EDP Schools

By Leete Doty
CW Associate Editor

The regulation of EDP schools across the nation runs the gamut from specific rules to voluntary to nonexistent, according to the results of a survey conducted by *Computerworld*.

Of the 40 states which responded, 24 reported some degree of regulation. Additionally, three states reported regulation under certain conditions, one reported that only registration was required, and one reported voluntary self regulation only.

Eleven states reported no regulation at all.

Pennsylvania, the only state known to specifically mention EDP schools in its regulation [CW, Sept. 8], is one of the best regulated. Maurice Ozer, secretary to the State Board of Private Business Schools, told *Computerworld* that the state was trying to establish even stronger regulations.

Several Outspoken

Several states without regulations were quite outspoken in the need for regulation.

"Yes! Standards are required to insure an effective, quality data processing education program [at private schools] such as that which exists in Georgia's 26 post-secondary vocational education schools," said Joseph D. Doldan, director of the Systems & DP Division of the Georgia Department of Education.

Doldan reported that private EDP schools fall under the jurisdiction of no state department and that the state currently has no plans to implement regulation of private EDP schools.

Regulation Seen Needed

Asked if regulations were needed, he answered with an emphatic "yes."

The reason, he said, was "to

(Continued on Page 8)

IBM Releases DataText Software to Customers

WHITE PLAINS, N.Y. – IBM has halfway reversed one of its policies and released the Call 360 DataText software, without program maintenance, to its customers. Previously, the DataText software had been a proprietary product not available to IBM customers but it was being used to support services offered in competition with some IBM customers.

The policy change, which was characterized as "just a soporific" by Jim Mullinix of VIP Systems, leaves open the question of whether the Call 360 services are in conflict with the 1956 IBM consent decree. The position of Call 360 Basic was not changed, and it continues to be a proprietary program.

The IBM announcement said that the DataText system was being made available to IBM customers "who are interested in operating a system devoted entirely to DataText using a specific configuration. The program is available on an 'as is' basis; for example, it will not carry program maintenance support."

Meaning Uncertain

No details as to the exact meaning of the announcement were available at press time. It appeared probable that the reference to a system having to be "devoted entirely" to DataText merely reflected the fact that Call 360 DataText has no provision for any background programming. The reference to the lack of maintenance support did not make it clear as to whether the

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Worldwide Systems Data to Be Offered

WASHINGTON, D.C. – The Air Force anticipates release Sept. 27 of preliminary specifications for replacement of the automatic data processing systems for the Worldwide Military Command and Control System, the Department of Defense said last week.

[illegible]ement of the system is potentially the [illegible]mputer procurement being considered by [illegible]ment. Fears have been expressed that the [illegible] bidder may be able to set de facto standards for a considerable number of industrial and government contractors.

"Release of these preliminary specifications at this time is to promote maximum industry competition and to provide for initial industry planning," the department said. "The release does not, however, indicate particular urgency for this procurement action."

There is no firm date at this time for release of the request for proposals, the department said.

Users Asked to Help Navy Commission New Division

Special to Computerworld

S. WEYMOUTH, Mass. – The South Weymouth Naval Air Station has invited computer manufacturers and users to participate in a symposium and exposition to be held at the base Oct. 26.

The keynote speaker at the event, the commissioning of a Reserve Systems Analysis Division, will be Navy Cmdr. Grace Hopper, a pioneer in data processing who is on the staff of the secretary of the Navy.

Companies or individuals in the EDP field who would like to contribute to the theme of "Computers and Computer Management for the Future" are invited to participate, said Lt. Cmdr. David Jaynes.

Particular emphasis will be given to providing a forum for announcing and displaying new products and techniques, he said.

New Division

The new division, to be manned by the Naval Air Reserve, will study, analyze, and develop projects utilizing computer methods and techniques.

Projects will include such things as command and control analysis, logistic planning, and antisubmarine warfare systems analysis and effectiveness studies for the active forces. The division also will develop and implement modern management methods for the Navy and Naval Air Reserve program.

Lt. Cmdr. Grace Hopper

Prudence and the Pill

TRENTON, N.J. – The story in the *Trentonian* was about oral contraceptives ("Thirteen million women throughout the world are using oral contraceptives.") and some wag on the newspaper's copy desk headed the item "Control Data."

IBM Releases DataText Software to Customers

(Continued from Page 1)

program would in fact be updated as IBM changed its own program.

Joan Van Horn of VIP Systems whose firm felt its business was threatened by IBM offering Call 360 services to their clients at an apparent uneconomic or subsidized rate [CW, July 31] was not available for comment. She was on the high seas sailing toward the Virgin Islands. Mullinix, a VIP executive, told of the new policy by *Computerworld*, said that "it was inevitable because of the requirements of the consent decree." However, he pointed out that it made little difference to VIP Systems because the Call 360 software, from their knowledge of it, "left much to be desired."

"VIP Systems," he said, "will continue to use ATS in competition with the Call 360 DataText simply because we can give our customers more service."

The real question, Mullinix said, is the definition of "service bureau." "A service bureau in 1968 is certainly not just what a service bureau was in 1956. Sometime, someone has got to sit down and decide what a service bureau is, in light of the terrific advance in technology. Then we can measure IBM's actions in this matter."

Antitrust Not Involved

An IBM spokesman denied that any part of the company's change in policy had been caused by a consideration of the antitrust situation and said that it had occurred simply because "we found there was an appreciable interest in the software."

IBM Man Explains Restriction of the Main PL/I Manual

By a CW Staff Writer

NEWTON, Mass. – An IBM speaker told a Route 128 DPMA chapter meeting here that the confusion caused by the PL/I language specification manual being in the hands of programmers was the reason for its withdrawal and unannounced replacement by a restricted manual [CW, Sept. 4].

"There were about 65,000 of the manuals out," said Robert Chernis, the IBM regional coordinator for PL/I, "and we often found programmers trying to write statements or options which had not been implemented. The idea of restricting the language specification manual was to prevent this. Restricting it was the fastest way we could do it."

PL/I vs. Cobol Emphasized

Chernis' talk was titled "PL/I, the Language of the Future?" and included an IBM slide presentation of how PL/I came out of a committee whose function was to find a successor for Fortran. His remarks, however, were more directed to the comparative strength of PL/I as opposed to Cobol rather than to Fortran. His argument was that the machine independence, ease of learning, and flexibility of PL/I were among the areas which gave it superiority as a single language. He pointed out that Codasyl, which acts as the sponsor of Cobol, recognized that Cobol, because of standardization activities, is not able to respond to user's needs quickly enough.

Questions Answered

In answer to some questions from the audience of data processing managers, Chernis said that the freedom of the PL/I language which allowed the language to be machine independent did mean that a manager could not see what configuration was required by a program on a PL/I printout as quickly as he could with Cobol. Asked about the incompatibilities between the OS and DOS PL/I compilers, he said that in his opinion the PL/I language was very closely meshed in with the available operating systems, and that as a result there could be incompatibilities between different operating systems both upward and downward. However, he estimated that 99% of the language would be compatible.

Standardization Position Given

Chernis said that PL/I standardization seemed to be moving forward. He showed a Standards Committee report, distributed from IBM's regional headquarters, which said that the committee was approving the language for further standardization progress and pointed out that no members of the committee concerned were IBM people. He also said that some seven or eight non-IBM companies had committed themselves to produce PL/I compilers.

In general, he recommended learning only parts of the language, and told about one of his customers who tried to learn the full language. He said that as a result 90% of their people quit. He himself, after 2-1/2 years with the language, still had not studied all of it, because he had never had the need, he said.

The meeting was the first of the 1968/69 year for the Route 128 DPMA chapter. Richard Wilson, of General Radio, chapter president, said that he believed that the year's program would be a major success.

Martell Gets SID Post

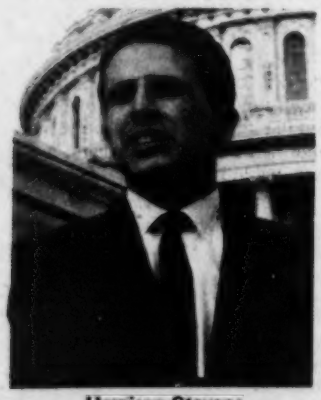
WATERTOWN, Mass. – John F. Martell, director of publications for Keydata and Adams Associates, Inc., has been elected chairman of the New England Chapter of the Society for Information Display.

Systems Analyst Running for Congress

By a CW Staff Writer

CONCORD, Mass. – Chandler Harrison (Harry) Stevens is running for Congress as an Independent. And he thinks the voters have been so alienated by the old guard of both parties that he has a good chance of winning.

Stevens, a McCarthy supporter, is a rare bird among politicians.



Harrison Stevens

He not only knows what a data bank is, he could program a computer to create one.

Stevens, a systems analyst and management consultant who worked for Adams Associates before successfully running for a seat in the Massachusetts State Legislature in 1964, is an important jump ahead of most elected officials in dealing with computer related problems. He may not know all the answers, but he at least understands the questions.

Computers and Government

While Stevens, who holds a Ph.D. in economics from MIT, is not campaigning on his computer background, he is quick to see ways in which computers can be used in the public interest. For instance, he designed an experimental computer graphics system for legislative redistricting which could help to eliminate gerrymandering.

Stevens believes Congress should have some members with technical backgrounds, people who won't have to rely entirely on outside advice on technology questions, people who know the right questions to ask about technological developments.

Stevens has a number of computer people on his campaign committee, a situation which contradicts a commonly held belief that computer people prefer to stick to their profession and to stay out of politics. (See editorial, page 4.)

Computer Service Helps Students To Choose Most Suitable College

Special to Computerworld

NEW YORK – A computer assisted service to aid students in selecting colleges was demonstrated last week at Harcourt, Brace & World, Inc. The publishing company is sponsoring the system, called Select, which was designed by Bernard Klein and Ray Kurzwell, seniors at MIT.

Prospective college students fill out a questionnaire and the data is matched against information on courses and academic competition at 3000 American colleges. The student's aptitudes in 15 subject areas are compared to the emphasis given that subject area at college.

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Applications may be obtained from high school guidance counselors or by writing to the company at 757 Third Ave.

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Jack K. Cook of the Los Angeles Forum accepts the first ticket printed by Ticket Reservations Inc.'s first automated ticketing terminal installed in the Los Angeles area. The others in the picture were not identified.

Number of Ticket Systems Jumps From Zero to Two

By a CW Staff Writer

LOS ANGELES – Two automated ticketing systems for entertainment and sports events are in competition here.

One system, Computicket [CW, April 10], started Sept. 9, is operated by Computicket Corp. of California, a subsidiary of Computer Sciences Corp.

The other system, designed by Digital Scientific Corp., is operated by Ticket Reservations, Inc. of New York [CW, Aug. 14]. It uses a Control Data 1700 computer.

So far as is known, no ticket agent has both systems installed, so that purchasers have to go to different locations to buy tickets sold by each system.

Charges Only Partially Given

Ticket Reservations told *Computerworld* that its agent terminals rent for $150 a month. The company said it requires renters to charge 25 cents for each ticket sold. Computicket declined to tell *Computerworld* how much its terminals rent for, but did say that renters receive rebates, depending on their volume, which would hopefully pay the rental charges.

Both companies declined to say how much promoters were charged for using the system, although Computicket did indicate that the maximum charge – it has three billing rates – was less than 6% of the ticket cost.

The Computicket terminal units are linked to Computer Sciences' El Segundo computer center. The terminal operator transmits the customer's request for seats to a computer, which scans its inventory of unsold seats and transmits its reply back. A CRT displays the section, aisle, row, seat number, and price of the best available seat or seats.

Upon the customer's acceptance of the offer, the terminal prints the actual admission ticket in seconds.

The Ticket Reservations system operates similarly, except that it uses a teleprinter instead of a CRT.

TRS Felt More Advanced

A spokesman at the Los Angeles Forum, who asked not to be identified, said it chose the Ticket Reservations system because it was felt to be about a year and a half ahead.

Among the Forum's preferences for the Ticket Reservations system were the printed audit trail and the fact that the keys on the terminal stayed pushed down. If a mistake is made during part of the inquiry, it can be corrected without having to erase the whole entry, the spokesman said.

The keys staying down is also an advantage when several inquiries are to be made involving only partial changes in data for each, such as the date, he said.

"From a time standpoint, that is a tremendous advantage," he said.

Computicket said that it is working on a modification to its system, which it hopes to have in operation by next spring, that will allow multiple entries differing only in dates to be entered in abbreviated form after the first full entry.

Bonding Provided

The Forum spokesman also said that a significant factor in choosing the Ticket Reservations system was that the contract provided a bond in the event of a computer caused loss of revenue. Similar protection was not available with the Computicket system, he said.

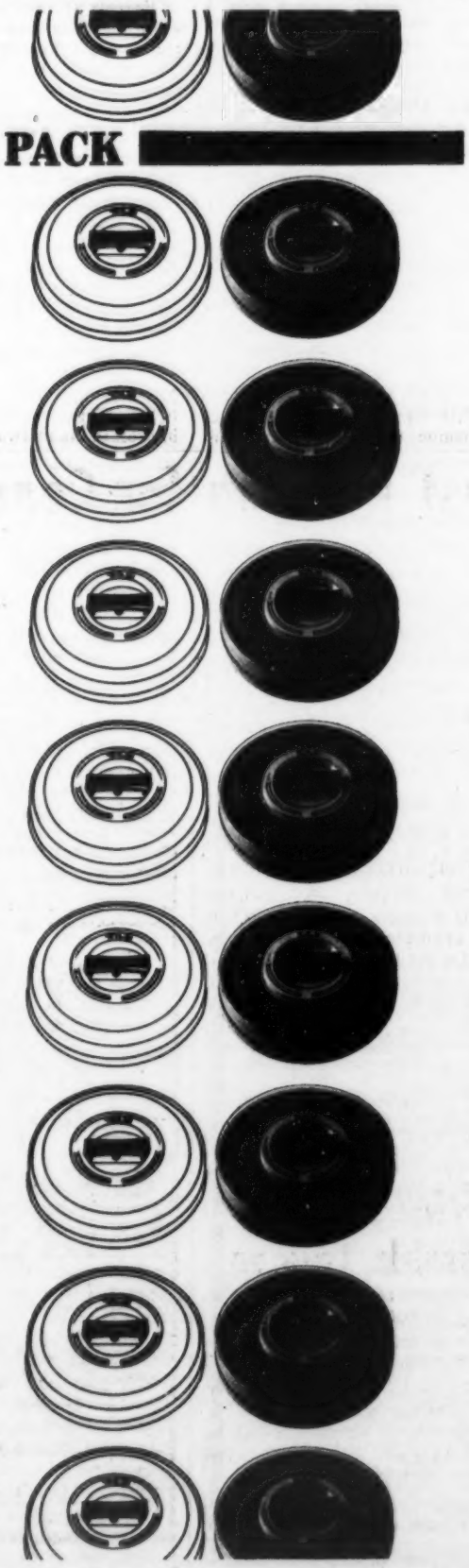
Ticket Reservations told *Computerworld* that the coverage – written by Fireman's Fund Insurance Co. – provided $50,000 per event, with a $2500 deductible amount, for losses incurred as the result of "system failures resulting from programming or personnel errors" up to a total of $1 million.

Both Have Safeguards

Spokesmen for both systems explained that safeguards are built into the system so that terminals cannot be placed on local operation and issue tickets without changing the central computer's inventory.

Audit records are also maintained that show the value and types of tickets printed at each terminal, they said.

Both systems also provide daily inventory records in a matter of minutes – a job that can take hours by hand – and advance sales information, they said.



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Editorials

The Good of the Industry

The fact that a substantial increase in the complaint level over improper billings has been traced to computer problems should not be glossed over. It is true that only 6% of the complaints made to the New York Better Business Bureau involve these problems – but it is also true that the problem is increasing fast.

It seems clear that the industry's performance is lacking in some way.

The key item appears to be the failure of many systems to include adequate facilities for acknowledging complaints correctly and for preventing rebilling while the validity of the complaints is considered. Both are necessary to avoid aggravating an already sensitive situation.

Computerworld feels that all billing systems should include both of these courtesies.

For the good of the company.

And for the good of the industry.

Harry Stevens, Candidate

Harry Stevens is a systems analyst. That's not unusual. Harry Stevens is very concerned about the future of his country and the world. Already a Massachusetts state representative, Stevens is running for representative in Massachusetts' Third Congressional District. That, from everything we hear, is very unusual.

There is almost a complete lack of computer oriented people in Congress even though computers represent one of the greatest challenges of our time (1984?). Computer people are not only failing to run for office – they often refuse to even venture a professional opinion on any subject that might be considered a political question.

Stevens (who is not campaigning on his computer background) believes that Congress should not have to rely on outside advice to handle computer related problems. We agree.

Because we are a national newspaper and Stevens is involved in a local election, and because we have not investigated the qualifications of his opponents, Computerworld is not advocating that readers vote for Stevens.

But Computerworld does endorse his candidacy – and wishes there were many more computer people like him.

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Point at Issue

Can You Prove It?

By Robert P. Bigelow
CW Contributing Editor

A letter from H.R. Valdez in the Aug. 28 issue of *Computerworld* questioned whether a punched card was a legal document. Valdez' inquiry is a subset of a broader problem which should concern every person who uses a computer for record keeping purposes. That question is: Can you get the records which your company keeps on computers admitted as evidence in a court of law?

Surprisingly, there has been little litigation on this question – so far. In fact, the law books report only a couple of court decisions on the question, and a few rulings by the Interstate Commerce Commission.

As background, let's look at the Law of Evidence, which determines what a jury can hear and what it can't. Evidence can be oral testimony from people who were there, it can be documents or objects, or (in certain cases) it can be expert opinion. Note the concept of personal knowledge: "In oral evidence the witness is the man who speaks; in documentary evidence the witness is the thing that speaks."

Hearsay Rule

To every item which is offered as evidence applies the famous Hearsay Rule. This rule says, essentially, John cannot testify that Sam said George was at the scene of the crime to prove that George was there. The reason is simple: George's lawyer can't test the truth of Sam's statement because Sam isn't in court to be cross-examined. The Hearsay Rule is particularly pertinent to business, since the person who testifies in court to the facts shown by the company's record is seldom the clerk who made the actual entry. The witness doesn't have personal knowledge.

But, like most rules, there are exceptions to the Hearsay Rule; one of them applies to entries in business records made in the regular course of business. There are some preliminary requirements that the judge has to find have been met before such records can be admitted under this exception. These include (1) the entry was made in good faith, (2) in the regular course of business, (3) before the law suit started, and (4) it was customary in the business to make such an entry either at the time it occurred or shortly thereafter.

Over half the states have enacted the Uniform Business Records as Evidence Act which says, "A record of an act, condition, or event, shall . . . be . . . evidence if the custodian . . . testifies to its identity and the mode of its preparation, and if it was made in the regular course of business, at or near the time of the act, condition or event, . . . and if . . . the sources of information, method, and time of preparation were such as to justify its admission."

When a company's records are kept on paper under the control of the accounting department, it is usually pretty simple for the head of the department to testify that the entry is of the type usually made and looks regular to him. However, this is not so simple when we start dealing with computerized records.

Punched Cards

Let us take Valdez' punched card first. If the card was prepared on a printing punch we will find some of the information about what it says printed along the top. But if there is nothing printed, the custodian must be prepared to produce a printout of what a judge once called "undecipherable machine accounting symbols," and to testify that the printout is the correct translation. If the transaction is made up of a series of punched cards the custodian must be prepared to produce all the cards and a printed translation of them in court, together with testimony as to how they were prepared and preserved in the ordinary course of business.

When we look to magnetic tape, we find that in 1965, the Supreme Court of Nebraska ruled that, under the law quoted above, the printout of the accounting records of an insurance company kept on tape was admissible as evidence in court when the insurance company was trying to collect a debt. The court said, "The statute was intended to bring the realities of business and professional practice into the courtroom and the statute should not be interpreted narrowly. . . . The machine here performs the bookkeeping task in the usual course of business. Instead of paper, the information and calculations are stored on tape, and may be retrieved and printed at any time. The taped record furnished a cumulative record based on information flowing into the office of the plaintiff company day by day and fed into the machine in response to a systematic procedure for processing each insured's account. . . . we are of the opinion that the sources of information, method, and time of preparation were such as to justify [the printout's] admission."

This court decision also should be helpful to the proponent of records kept on disk and drum. But records kept on these memory devices may prove less permanent than a tape and therefore more difficult to authenticate as being complete.

Documentation Questionable

Which raises another problem. Is there a reader who would care to state under oath that he is sure that the documentation for all his programs is accurate as of any particular date? Sometime soon a lawyer will cross-examine the custodian of computerized records on how he is so sure that the program which produced the result which has been offered as evidence actually was the program which operated. Unless the documentation is pretty good, the judge may rule that the records are not dependable and therefore cannot be admitted.

Management also must be prepared to prove the security of the data recorded on tape or other computer memory devices. Recently there have been quite a few articles on the proper care and handling of computer tapes (for example, the articles by Shapley and Teyssier in the April and August issues of *Data Processing* magazine), and on security precautions in managing the tape library and data files [CW, Sept. 11].

Sometime soon an unhappy data processing manager will be cross-examined by a lawyer who will proceed to prove to the satisfaction of the judge that the computerized records were handled so inefficiently and with such poor security that they are absolutely unreliable.

That computer manager will soon be looking for a new job. I hope he isn't you.

Letters to the Editor

Whither the Masters?

To the Editor:

After reading your article "Masters Courses Ignore Business DP" in the Aug. 21 issue, I begin to wonder on the "marketability" of students with a master's degree in computer science and exactly where they fit in the computer and information processing community. The article conveys the impression that current M.S. students are weak and inadequately trained in the areas where industry requires the most help.

I make this statement because as chairman of a two year associate degree program in computer technology, our graduates:

1. Are thoroughly familiar with the programming languages of Fortran, Cobol, RPG, Algol, PL/1 as well as a machine and assembly language on a third generation computer.

2. Have been exposed to courses in data processing management, system design, and commercial or scientific applications.

3. Have had at least one course in numerical analysis and computer mathematics.

4. Have taken computer application courses in statistics, linear programming, Pert, CPM, and simulation.

5. Have been trained using the "hands on" approach to operate computers and other peripheral devices and to debug their programs.

Obviously, the M.S. student should be superior to the A.A.S. student in view of his academic experience. However, the A.A.S. student is at least "marketable" and has a place in the real and practical world of computing.

From my contacts in industry, it has been disappointing to observe some recent M.S. students who have been trained in the theoretical aspects of computer science not to be able to apply their training to the solution of the practical problems facing industry. I strongly feel that more effort should be exerted in tying in the various

(Continued on Page 5)

'Mini Company' Helps Replace Vanishing Audit Trail

The Bell System was one of the first and is now one of the largest computer users in the world today. It recognized nearly 10 years ago the problems which the computer was bound to bring into the operations of audit departments and started training auditors to evaluate computerized billing systems, appraise controls, and test conversion procedures.

Currently, Bell System companies have over 60 auditors specifically trained in auditing procedures for computers – and more are being trained. As a result of their experience in the field, they now believe that the day of the audit trail is vanishing, if it has not already vanished.

This article describes the problem, as seen by Joseph J. Wasserman, manager of the audit development department at Bell Telephone Laboratories, Holmdel, N.J. It is condensed from the July/August Bell Telephone Magazine.

Through the Looking Glass

When punch card computer systems first appeared, auditors generally followed an "around the machine" approach. Essentially, this consisted of testing the relationship of input and output in terms of the function being performed by the machine. For example, if two cards representing both fixed and variable payroll information were fed through a punch card calculator, an auditor could at least partially test the program by manually determining that paychecks were accurate. However, this technique usually was ineffective for checking reports or summary information being accumulated throughout the process. It would be quite possible to process a paycheck correctly, but to accumulate annual tax data incorrectly. The auditor was comparing the machine's input with its output much as he would have compared voucher files with ledger books 50 years ago.

If this technique was ineffective for punch card systems, it is almost useless with today's high speed magnetic tape systems, and will be even more so with on-line, real-time systems. In a very real sense, the auditor now must work *through* the machine – which means he must understand what the program is doing and how it does it. The auditor must be able to use the machine itself as a tool to audit its own operations. He no longer has piles of paper to paw through. The classical "paper trail" or "audit trail" is vanishing and is being replaced by invisible arrangements of molecules in an iron oxide coating on plastic tape or on drums.

The "audit trail" needs redefining because it is now a misleading term. Many system design people seem convinced that controls are built into a computer system only to satisfy the outdated whims of the auditor. The capability to trace source documents through a system, to recreate tapes that might be lost or destroyed, to detect errors and prevent their subsequent re-entry, is as important to the programmer and anyone in management who uses the data as it is to the auditor. Management itself has the greatest stake here because failure to provide such controls can literally cause chaos in a business and could result in huge financial losses.

Means to the End

Clearly, if auditors are to gain the expertise needed to meet their expanded responsibilities, they must develop really creative auditing techniques that fit the age of third generation computers.

One of the first audit techniques "through the machine" involves a sampling concept, that tried and true tool of statisticians. A scientifically designed sampling program extracts every Nth record from a file for examination. This permits an auditor to appraise a situation through a sample – but using the speed and accuracy of the computer to extract the sample.

Some of the Bell System companies are now using a refinement of this technique to audit accounts receivable. Instead of merely selecting every Nth account, they review every account and extract only those meeting certain logic tests, which for predetermined reasons warrant attention. Then, when the computer has separated the wheat from the chaff, the auditor can spend his time analyzing only critical accounts rather than plowing through thousands, 95% of which need no attention.

Another audit technique is the "test deck" concept. This is actually an offshoot of the programmer's testing procedures, and can test all functions built into the system. The drawback is the fact that it takes valuable computer time, and is also difficult to maintain because of frequent computer program changes. Several of the Bell companies have developed an innovation on this technique which is proving very valuable. This – which is done during the developmental stage of a system – entails establishing an imaginary "account" or "office" for the auditor.

'Mini Company' Concept

A refinement of the imaginary account principle is Bell Laboratories' "Mini Company" concept. This is an expansion of the test deck, and is a complete model subsystem running concurrently on the machine with the regular live system. By comparing known data from the live system with test data from the fictitious Mini Company transactions, auditors can quickly spot any irregularities in controls or processing within the machine.

The "audit module" includes many known audit techniques which will become part of the normal computer system and which can be called in when the auditor wants them. These are sampling, extraction, comparison, compiling, and extension. This makes the machine the auditor's tool so he can audit the system on a current, not an historical, basis. He can detect errors or control breakdowns sooner. The input/output devices can be in the auditor's office so he can activate an audit without visiting the accounting center. The audit module, built into the computer system, will enable the auditor to validate meaningful data more comprehensively.

The Mini Company concept is extremely flexible, for we can use any kind of input and output device, and, as with the audit module, these can be located in the audit office, remote from the central computer. With communications links, we can interface with other computer systems for audit purposes. It also can be used by a programmer for testing or a daily quality control.

No one would pretend that we have all the answers to the problems raised by the computer. But experience has convinced us that training is needed both throughout industry and the auditing profession. The time is here when the auditor must be able to let the systems design people know exactly what procedures he will need to audit the computer so he can assure management that it has a well-controlled, fully auditable system.

Letters to the Editor

(Continued from Page 4)

A.A.S. degree programs with those existing B.S., M.S., and Ph.D. programs in the areas of computer science since all these programs are part of a continuum called computing and information processing.

Dr. John Maniotes
Section Chairman
Computer Technology

Purdue University
Hammond, Ind.

One 'P,' Two 'As'

To the Editor:

Just another example of the kind of problems a national data bank will be faced with. Imagine your reporter's confusion when he cannot locate "Apalachin" because he spelled it "Appalachian" [CW, Aug. 28]. Numbering schemes ala ZIP (Zero in Performance?) are not the answer. Extensive cross-indexing is expensive, but essential to a system appropriately responsive to man's needs.

Apalachin, incidentally, is pronounced A-pa-*lake*-kin by the natives. It is located about seven miles west of Endicott, New York, home of IBM.

Myron E. Williams
Programmer

Apalachin, N.Y.

Your point is well-taken. In this case the problem lay in the automatic correction technique used here. We *knew* that "Apalachin" was wrong – and corrected it! Ed.

File Security

To the Editor:

Your suggestions on "Improving the Security of Files" [CW, Sept. 11] prove, if anything, the impossibility of protecting a file from people who really want to get at it, and simultaneously the inevitability of the development of hocus pocus protection systems which in the long run will only frustrate legitimate users and serve as a shield for infiltration by the underworld. The only other answer is not to develop the Data Bank at all. Heaven help us.

James Enterline
President

Enterline Automation
and Computing, New York

I like your honesty in facing issues, but hope that we can go ahead and minimize – if not eliminate – the dangers, so making it practical to go ahead with the exciting future. Ed.

Computerworld **welcomes comments from its readers on any subject related to information handling and electronic data processing. Letters should be addressed to: Editor, Computerworld, 60 Austin St., Newton, Mass. 02160.**

Readers also may call in their letters. Call (617) 527-2711 day or night and your opinions will be recorded.

Noteworthy

File Addressing by Calculation

By Ivan Flores
CW Guest Reviewer

"Scatter Storage Techniques," by Robert Morris, *Communications of the ACM*, Vol. 11, No. 1, Jan. 1968, pp. 38-44.

Consider a sorted file in main memory. There are many ways, knowing its key, to look up a record in this file. The most time consuming of these is a linear search starting at the beginning of the file and looking through it until we find the record. Binary search methods are a distinct improvement, but programming is more complicated and time consuming. Instead wouldn't it be nice if we could just take the key of the record and by applying some formula determine the exact position in core storage to find that record?

Then what is an *imperfect* formula? Well, such a formula generally takes us to the spot we desire. But once in a while we find that it takes us to a spot occupied by another record – one whose key is very close to the one that we desire.

In employing an *imperfect* transformation formula we must have some way to make up for its imperfection. What do we do when we get to the wrong spot? Morris talks about some alternatives, such as searching the neighborhood, searching linked lists, and so forth. He also discusses the transformation formulas themselves.

Above I have tried to emphasize the importance of this technique in searching core memory. It has a similar importance when applied to disk or random access devices. Morris provides a fine review of all the work reported in literature. If you go back to the articles in his bibliography you will find Morris' presentation much better than the others. This "hashing" technique vies with tables and indexes and in some ways is superior to them for quick look-up. The coverage of these topics is otherwise inadequate in the literature.

Finally, his article is well written and easy to follow.

—

Dr. Flores is a well-known consultant and author. His recent books include Computer Software *(1965),* Computer Logic *(1966), and* Computer Sorting *(1968).*

Many good articles and books are overlooked. This column is devoted to reviewing such material. If you know of any *really good* published works, you are invited to tell us about them.

TLW Computerworld Corner

	COMPUTERS FOR SALE	INDUSTRY
Item 1:	360/30 MOD F, 1051-1, 1052-6. AVAILABLE 11/68.	Aerospace
Item 2:	1401 C4, 1402-1, 1403-2, 1406-1, 4-729II's. Advanced Programming, Print Storage, Numerical print, Hi-Lo-Equal, and others. AVAILABLE 11/68.	Banking
Item 3:	1410-40K, 1415, 3-1414's, 4-729's, 1402, 1403. AVAILABLE 60 days.	Food
Item 4:	1401 C4 8K with 1402, 1403 and 3-1311's. AVAILABLE 90 days.	Manufacturing
Item 5:	IBM 1620-20K and 40K. Additional instructions. Auto Divide. Indirect Address. 1622-1, 1623-1. AVAILABLE 30 days.	School

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Lockheed Hired To Plan City's Data System

SUNNYVALE, Calif. – Burbank, an industrial and residential center of 100,000 persons in the San Fernando Valley, has selected Lockheed Missiles & Space Co. to plan a citywide computerized information system for its municipal operations. Under contract to the Office of Civil Defense, the University of Southern California performed a research study into the interdependence of city departments on common data, and Burbank was the city studied.

Real Time Monitor System

NEW YORK – A real-time system monitor has been developed for Humble Oil & Refining Co. by Programming Methods, Inc. The system operates on an IBM 360. On-line applications may be implemented in any IBM language to operate concurrently in a multiprogramming environment and support any IBM or Teletype terminals, as well as Sanders CRTs. The first two real-time applications on the system are an inventory system for a refinery warehouse and the automation of a petroleum products testing laboratory.

CONTRACTS

Aviation Forecast

LOS ANGELES – Quinton Engineers, Ltd., has selected Planning Research Corp. to develop a forecast of aviation activities to be used as a basis for Quinton's design of the Long Beach Airport master plan. The study will determine the need for the airport complex through analyses of the factors which determine size, location, and layout of the terminal complex area, based on aircraft and passenger requirements. Economic factors will also be studied, as well as a forecast of airport activity through 1987. Stephen F. Kornish of Planning Research will head the analysis group.

Nasa Extends Contracts

EL PASO, Texas – Nasa has awarded two contract extensions to Computing and Software, Inc. for specialized data processing services at the Goddard Space Flight Center, Greenbelt, Md., and Langley Research Center, Hampton, Va. The Goddard contract provides a continuation of a 2-1/2 year agreement for on site data systems planning, computing services, and operation of IBM 360/91, IBM 360/95, and Univac 1108 systems. The Langley contract will provide data processing services for aerospace research and vehicle simulation programs. Control Data 6600 and 6400 computers and central recording and data transcription equipment will be used at Langley.

Grant and Loan System

WASHINGTON, D.C. – The Bureau of Health Manpower, Arlington, Va., has awarded a contract to Computer Usage Development Corp. for the design and implementation of a computerized system for the bureau's Grant and Loan System.

EDPeople

IS NOW	AT	WAS	AT
Roderick E. McMillan	Head Computer Division	Applied Logic Corp. Princeton, N.J.	Manager Digital/Hybrid Programming	Electronics Associates Inc.
Joe P. Martinez	Research Associate	Dikewood Corp. Albuquerque, N.M.	Communications Officer	U.S. Air Force
Herbert L. Bansbach	Director Advanced Planning	Control Data Corp. Minneapolis, Minn.	Sales Executive	Northrop-Nortronics Inc.
Frederick A. Wilhelm	Engineering Mgr. Large Computers	Honeywell Computer Control Framingham, Mass.	Technical Staff	Electronic Associates Inc.
T. A. Jenkins	Vice President	Datel Corp. San Francisco	Manager Communication Programs	RCA Washington, D.C.
Joseph J. Strnad	Assistant General Manager	URS Systems Corp. San Mateo, Calif.	Chief Doctrine and Systems	Logistics Dept. of the Army
Lance N. Lazo	Vice President Consulting	Computer Results Corp. W. Springfield, Mass.	Manager Information Systems	Milton Bradley Co. East Longmeadow, Mass.
Charles C. French	Marketing Manager	Viatron Computer Systems Burlington, Mass.	Vice President	Mathatronics Div. Barry Wright Corp.
Samuel G. Barton, III	Manager Advanced Systems Design	General Analytics Corp. New York	Manager, Federal Gov't. Information Exchange System	Computer Sciences Corp. Los Angeles
David S. Mathews	Vice President	Digital Seismic Corp. Houston	Manager Marine Seismic Operations	Alphine Geophysical Associates, Houston
David Clayman	Manager Educational Development	Viatron Computer Systems Corp. Burlington, Mass.	Consultant	Wang Laboratories
David G. Shields	Vice President	Datalogics, Inc. Cleveland, Ohio	Director Information Processing	Glidden-Durkee Div. SCM Corp.

R.E. McMillan J.J. Strnad L.N. Lazo C.C. French D. Clayman D.G. Shields

New EDP Employment Agency Opens Its First Office

EXPANSIONS

WALTHAM, Mass. – Career Paths, Inc., a new company specializing in the counseling and placement of men and women in all areas of electronic data processing and computer technology, has opened its first office here.

According to William E. Donahue, the founder and president, it is the first of several offices to be opened in major cities within the next year.

Donahue was most recently vice president and director of marketing for Keydata Corp. and formerly in sales management in IBM's Data Processing Division.

Data General Plans New Construction

HUDSON, Mass. – Data General Corp., a newly formed company, has announced plans for construction of a building on a 15 acre site on Route 495 in Southboro, Mass., to manufacture small scale general purpose digital computers. Production is expected to begin in December of this year.

Scientific Data Moves Into New Quarters

LOS ANGELES – Administrative and programming personnel at Scientific Data Systems moved into a new 320,000 sq. ft. building in El Segundo. When fully occupied in October, the building will house the company's administrative, marketing, programming, engineering, executive, and financial departments, totaling about 1300 employees. Construction began in 1965 on the 37 acre industrial park site. The first building was completed and occupied in October, 1966, and now functions as the company's manufacturing and systems integration facility. It houses 1600 manufacturing and engineering personnel. Two additional buildings scheduled for completion before the end of the year will house the subassembly and peripheral equipment manufacturing groups.

Control Data Forms International Organization

MINNEAPOLIS, Minn. – An international organization has been formed within the Data Centers Division of Control Data Corporation, according to R.R. Burns, director of the firm's data centers. Leo C. Murphy, Jr. has been appointed general manager of the new organization, International Data Centers. Currently the company has seven internationally based data centers operating in Mexico City, Ottawa, Frankfurt, Stuttgart, Rome, Milan, and Melbourne.

Bank Installs Audio Response Unit

Orders and Installations

Citizens and Southern National Bank, Atlanta, has installed an IBM 7770 audio response unit and two IBM 360/40s. The system links 340 telephones in 32 branches in the Atlanta area. Future plans call for the installation of CRT terminals for access to records stored in the computers. Initially, the on-line inquiry system will process only checking account inquiries.

Shamrock Foods Co., a Tucson, Ariz., dairy, has installed a Univac 9200 computer and ordered a second for installation at its Phoenix facilfty. The computers will be used for route accounting, payroll, and accounts payable and receivable.

St. Vincent's Charity Hospital, Cleveland, has ordered a Univac 9200 computer system for delivery this month. The system will be used for billing, accounts receivable and payable, payroll, inventory control, purchases, and general ledger work.

7070/74, 7080, 7094 FOR SALE

IPS has for sale and delivery in the near future several attractively-priced IBM 7000 series systems. A 7074 10K with 7 729 VI (90KC) tape units can be delivered January 1st. Available for immediate delivery is a very reasonably-priced 7070 10K without tapes. Also for immediate delivery is a 7080 160K system without tapes. For an installation requiring a powerful scientific system, a 7094-I with 13 729 VI's and V's is available Jan. 1, 1969. The 7094 also has a 1401 4K I/O system available as an option. Please call or write for specifications and prices.

IPS

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Off-Line Collection Unit Punches Out Tab Cards

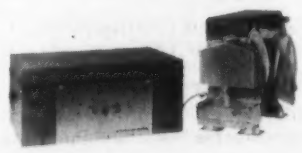
A new data collection system converts source data to punch tab cards, bypassing conventional keypunching and verifying operations. The Datacon System 250 consists of a console for entering repetitive and variable data, plus a card punch. All semi-fixed data to be entered on a series of output cards is accomplished by a preset 10 column pinboard unit. Variable data is entered by positioning any of 20 leversets. Typical uses include inventory control, job costing, billing, and payroll systems. Datacon International, 15158 S. Cicero Ave., Oak Forest, Ill. 60452.

New Products

Data Rack

A new data rack, priced at $98.95, uses the suspension principle for the referral and retrieval of data processed records in nylon post binders. The sliding top can be locked for security. Hanger bars are included for adapting binders to interior side rails. Sides and ends are steel. Legs are chrome plated, and the casters are ball bearing. The top is laminated oak grain plastic, impact and soil resistant. Wilson Jones Co., 6150 Touhy Ave., Chicago, Ill. 60648.

Punch Control

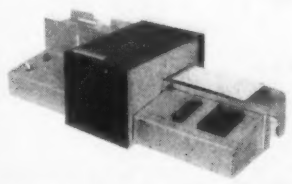


The Model 1920 punch control is designed to provide the interface for logic level control of the BRPE punch. Input requirements are the data characters and a punch command. An output line for punch, busy, or low tape is provided. Digi-Data Corp., 4315 Baltimore Ave., Bladensburg, Md. 20710.

Hybrid Computer

A new hybrid computer, the EAI 7800, is wired for a minimum analog/hybrid configuration but can be expanded by adding functional modules. The 100 volt machine is designed to go hybrid or to be used in on-line or real-time applications. The unit includes conventional patching and peripheral equipment for data reduction, readout, and recording. Users can choose computation capability from a 10 volt desk top computer to a 100 volt hybrid computing system. Electronic Associates, Inc., West Long Branch, N.J.

Card Reader



A new card reader with automatic hopper feed for 250 cards reads photo optically. The model 500-30, priced from $900, can be supplied with Hollerith to ASCII interfacing for use with standard Teletype equipment. It is also available with the Data Phone 401 interfacing and keyboard for signaling additional data. Applications include inventory control, recording of parts, hospital billing, and machine time production information. Delivery is six to ten weeks. Vema Industries, Wyckoff, N.J. 07481.

Punch Tapes

A total of 71 new fanfold punch tapes for applications in data processing, communications, numerical control, photo typesetting, and computer functions have been announced by Robins Data Services. Widths are from 11/16" to 1". Robins Data Services, Inc., 15-58 127th St., College Point (Flushing), N.Y. 11356.

Converter

A new analog to digital converter, model IAD-1850, is designed for use with high speed data acquisition systems. The unit contains its own reference supply and "sample and hold" circuitry, and can be mounted in a standard 19" rack. Applications are radar and sonar signal processing systems, process control systems, and medical data systems. Inter-Computer Electronics, Inc., 1213 Walnut St., Lansdale, Pa. 19446.

EAI 7800 hybrid computer

Datacon 250 data collection system

Digital Reducing the Price Of 8/S Memory Modules

MAYNARD, Mass. – Price reductions of up to one third have been announced for memory expansion modules for Digital Equipment Corp.'s PDP-8/S computers.

Typical of the reductions, the company says, are a $1500 cut to $3500 for expansion from 4K to 8K, a $1200 cut to $2800 for expansion from 8K to 12K, and a $1000 cut to $2000 for expansion from 12K to 16K.

Comparable reductions are in effect for expansion up to the 32K capacity of the PDP-8/S, the company said.

The PDP-8/S is a 12 bit general purpose computer priced under $10,000 and is compatible with other PDP-8 computers, the firm said.

Western Systems Formed In Utah As Service Firm

SALT LAKE CITY, Utah – Western Systems, Inc. has been formed here to offer programming, consulting, and educational services.

Robert S. Carter, president, said that the new company will emphasize ways of improving the return on investments in human resources in the programming field.

Pearson Hunt Elected A Director of Viatron

BURLINGTON, Mass. – Dr. Pearson Hunt, a Harvard University Graduate School of Business Administration professor, has been elected a director of Viatron Computer Systems Corp.

In announcing the election, Viatron President Dr. Edward M. Bennett said that Hunt would continue to serve the company as a financial advisor and consultant.

Theodore H. Braun Elected Applied Computer Head

LOS ANGELES – Theodore H. Braun, former senior vice president of Systems Development Corp., has been elected president of Applied Computer Technology Corp.

Braun is a member of the Board of Councillors of the University of Southern California School of Engineering, former chairman of the Offshore Research Committee, a member of numerous technical and management associations, and a registered professional engineer.

Charles G. Calderaro Named to New URS Post

SAN MATEO, Calif. – Charles G. Calderaro, executive vice president of URS Systems Corp., has been named additionally to the newly created position of president of URS Co., the largest operating unit within the corporation.

Calderaro joined URS in 1960, and served as vice president and general manager of the corporation's Information Sciences Division from 1962 until his promotion last year to executive vice president.

Prior to joining the company, he was deputy director of the Advanced Systems Development Division, USAF Logistics Command, San Bernardino Air Materiel Area.

$28 Million Plum

AF Test Range Contract Renewed

VANDENBERG A.F.B., Calif. – A $28,380,570 contract for continued operation and maintenance of the Air Force Western Test Range's technical facilities has been awarded by the Air Force to Federal Electric Corp., service associate of International Telephone and Telegraph Corp.

Robert E. Chasen, president of Federal Electric, said the one year contract gives Federal Electric the responsibility for operating and maintaining all technical facilities of the range.

Another responsibility is the maintenance and operation of a new automated telemetry system which forms a vital communications link to support Apollo and other space programs now being developed, Chasen said.

Federal Electric personnel are stationed at Vandenberg Air Force Base, headquarters of the Western Test Range; Hawaii; Eniwetok, Marshall Islands; Pillar Point, Calif.; Port Hueneme, Calif.; and aboard five Apollo tracking ships which will be stationed around the world in support of the Western Test Range mission.

'360 Compatibility' Survey Is Offered

By a CW Staff Writer

NEW YORK – A $500 survey service aimed at helping manufacturers enter the System 360 market has been started at Programming Sciences Corp. The survey covers hardware and software characteristics of the System 360 and provides manufacturers of peripheral devices with information on how much effort will be necessary to achieve compatibility.

In the past, details of such items as standard interface have been placed by IBM in many manuals. Gathering them together has been a major problem for the peripheral manufacturers. The new service, believed to be the first of its kind, is aimed at reducing the cost to manageable proportions.

In the hardware area, specific details of the requirements for remote and local connection and system support are provided by the service. Software details include necessary modifications to both OS and DOS, as well as information on program maintenance, documentation, and distribution.

Programming Sciences has held the Cobol maintenance contract from IBM for Cobol F and recently has produced a survey of alphanumeric CRT displays with details of their compatibility to System 360. The report originally was prepared for the Prudential Life Insurance Co. of America. PSC, which is now selling the report, recently returned most of the money paid by Prudential as a royalty fee.

Lockheed Division Changes Its Name

PLAINFIELD, N.J. – Lockheed Electronics Co. has renamed its Avionics and Industrial Products Division the Data Products Division.

"Since the Los Angeles based division is primarily a manufacturer and developer of computer memory systems, ferrite memory cores, and printed circuit boards, the new name better identifies the division," said Lockheed President A.J. Grant.

The Data Products Division supplies memory systems and components.

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"MORE THAN $60 MILLION OF COMPUTERS ON LEASE"

State Control of EDP Schools Varies

(Continued from Page 1)

protect the thousands of individuals, who can least afford it, from throwing away their life savings on ineffective education and the false implied promise of high paying jobs as computer programmers."

"Graduates of such schools who really have an aptitude for DP (and most do not) would find that they would qualify as a DP trainee with the state government at $345 per month," he said. "These same people, had they attended one of our [public] vocational education schools for two years at an approximate cost of $250 for books, would qualify for a programmer trainee position at a starting salary of $531 per month, with a potential of $746 per month in three years."

New York Seeks Regulation

New York, which has regulation only on a voluntary basis, was also quite outspoken on the subject of regulations.

"We definitely believe that registration and regulation should be required on a mandatory basis, not a permissive basis," said Dr. John M. Leslie, director of the Division of Special Occupational Services of the Department of Education. Unregulated schools represent unfair competition to schools which voluntarily meet state standards, he said.

"We would appreciate [receiving a copy of] your findings as a result of this survey, and we enlist your support in our efforts to revise our legislation," Leslie said.

New legislation containing regulations pertaining to advertising, methods of instruction, equipment, teacher qualifications, and solicitors was introduced in the legislature last year, but was killed in committee, Leslie said.

Out of State Problems

Maryland is fighting a problem with schools which are unable to meet the strict state regulations, open in nearby areas without regulation, and attract Maryland students.

"Our greatest effort is spent in preventing poorly planned schools from opening," C.L. Speck, supervisor of nonpublic specialized schools, told *Computerworld.*

"We estimate that approximately 80% of the individuals expressing interest in opening schools in Maryland never do so," he said. "Unfortunately, many of the potential operators solve the problem by going to nearby areas which have no approval procedures and operate with very bad results."

No Cost For Approval

"Since our approval is at no cost to the school, our only interest is in good schooling and ethical business practices," he said.

Maryland was one of the few states with regulations that did not require a licensing fee.

Speck also reported that additional laws were under consideration.

"Specific minimum standards in EDP, especially programming," are needed, Speck said.

Delaware, Virginia Answer

Both Delaware and Virginia, which border on Maryland and which have no school regulation, reported that regulation is felt needed but that no regulations are currently being considered.

Virginia – which reported that two, possibly three, schools were forced to close their doors "because poor reputation lowered enrollment" – was critical of the lack of regulation.

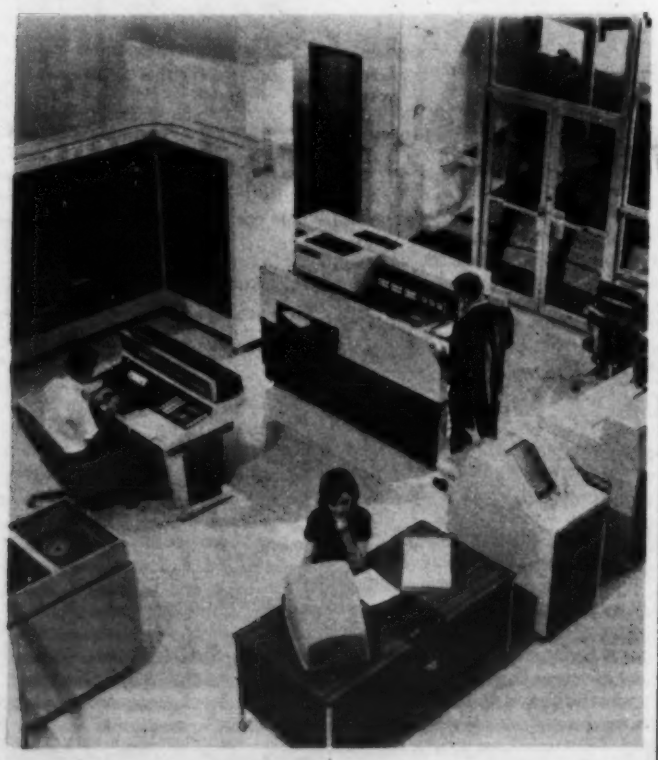
"Schools use misleading advertising, do not give students what they need in various DP occupations, and accept unqualified students," Marguerite Crumbly, state supervisor of business education, told *Computerworld.*

But regulations are under study and are to be submitted to the legislature when it meets next in 1970, she said.

State by State Summary of Survey Results

State	Number of Schools	Any State Regulation	Standards Are Established For: Advertising	Solicitors	Instructors	Entrance	Courses	Graduation	Enforcement Actions Or Results Reported	More Control Thought Needed?	More Control Being Considered
Alaska	3	Yes	X				X	X	None		
Arizona	6	Yes[1]	X		X	X	X	X	None	Yes	New regulations effective Jan. 1
California		Yes	X	X	X		X	X	Some required to improve	No	No
Colorado	10	Yes	X	X	X		X		2 closed willingly	No	
Connecticut	15	Yes							None	No	
Delaware	4	No							None	Yes	No
Florida		Yes[2]							None		Yes
Georgia	25	No							None	Yes	No
Hawaii	6	Yes[3]	X		X		X		None		Yes
Idaho	5	Yes[3]							None		
Illinois	28	Yes	X	X	X	X	X	X	Improvement asked of some schools		New regulations effective Dec. 1
Iowa		No							None	Yes	Yes
Kansas	8	Yes		X					None	Yes	No
Kentucky	7	Yes		X					None		No
Maryland	23	Yes	X	X	X	X	X		1 closed – see story	Yes	Yes – see story
Massachusetts	100	No							None		Yes
Michigan	18	Yes	X		X	X	X	X	1 closed, others given time – see story		No
Minnesota	6	Yes	X	X	X				None	Yes	Yes
Mississippi	12	Yes							None		
Missouri		No							None	Yes	No
Nebraska	6	Yes	X	X	X				None	Yes	Yes
Nevada	3	Yes	X	X	X		X		None		No
New Hampshire	3	No							None	Yes	No
New Jersey	40	Yes	X		X	X	X		None	Yes	Yes
New Mexico	3	Yes							None		
New York		Yes							None	Yes	Yes
Ohio		No							None	Yes	Yes
Oklahoma	11	No							None	Yes	No
Oregon	1	Yes		X	X	X		X	None		No
Pennsylvania	50	Yes	X	X	X	X	X		None	Yes	Yes – see story
Rhode Island	6	Yes	X						None		No
S. Carolina		Yes	X	X							
S. Dakota	0	Yes	X						None		
Tennessee	13	Yes		X					1 closed, bankrupt		No
Texas	36	No							None		Yes
Vermont	2	No							None		No
Virginia	10	No							2 or 3 closed by bad reputations	Yes	Yes – see story
Washington		Yes	X	X			X				
Wisconsin	7	Yes[5]	X	X					None	Yes	No
Wyoming	0	Yes	X	X	X		X				

1: Only if training veterans and children of veterans under Title 38 U.S. Code. 2: Only if veteran or war orphan benefits applied for. 3: Registration only. 4: Voluntary self regulation. 5: Only if solicitors used. 6: In some cases, the number of schools is estimated. 7: In some cases, officials have been unwilling to commit themselves on this question.
(Blanks indicate either that the question was unanswered, did not apply, or information was not available.)



The computer room at the new Control Data Institute in Burlington, Mass., is in sharp contrast to some of the storefront schools that have opened.

Computer Industry Seen Helping Poor

LOS ANGELES – The computer industry holds greater promise than any other in the upgrading of the skills and earning power of the underemployed, Robert W. Sarnoff, president of RCA, said last week.

Those seeking employment in the computer industry will find no preconceptions or insurmountable barriers to be overcome, Sarnoff said at the dedication of RCA's new Information Systems Center here. "It is truly a field of equal employment opportunity."

He noted that computer skills are now being taught not only to high school and college students, but also to youngsters in reform school, adults in prison, and underprivileged residents of the urban ghetto.

Widespread Use Foreseen

Predicting that the computer's everyday use in the home will become commonplace before the end of the 1970's, Sarnoff said when this happens "the number of job openings should rival those in television."

He said the computer ultimately will become a device for widespread personal use comparable with the telephone.

"Properly used," Sarnoff added, "the computer is an instrument to serve society and not to enslave it, to advance human goals, to give men and communities new scope for growth and new horizons for progress."

The new Information Systems Center contains advanced computer equipment to serve the data processing needs of RCA's divisions and plants and to provide backup support for its customers and prospects on the West Coast.

CALENDAR

S M T W T F S S M T W T F S S M T W T F S S M T W

Oct. 6-10, Montreal, Canada – 10th Annual EDP Conference and Retail Research Institute. Contact: Ethel Langtry, National Retail Merchants Assn., 100 W. 31st St., New York, N.Y. 10001.

Oct. 14-16, New Orleans, La. – Fourth Annual Meeting of Echo. Contact: Richard A. Crenshaw, Dir. of Data Processing, Hillcrest Medical Center, 1120 S. Utica Ave., Tulsa, Okla. 74104.

Oct. 20-23, St. Louis, Mo. – Systems and Procedures Assn. International Systems Meeting. Contact: Richard L. Irwin, SPA, 24587 Bagley Rd., Cleveland, Ohio 44138.

Oct. 21-23, Newport Beach, Calif. – Swap-Coop-Scope Joint Conference. Contact: James Hatch, Swap, Saginaw Steering Gear Div., G.M.C., 3900 Holland Rd., Saginaw, Mich. 48605.

Oct. 22-23, Washington, D.C. – First Annual Law of Software Conference. Contact: Computers-in-Law Institute, The George Washington University, Bacon Hall, 2000 H St., N.W., Washington, D.C. 20006.

Mill Automated From Order to Delivery

TOKYO – A system for computer control of steel sheet production from acceptance of orders to production, shipment, and delivery has been introduced by Nippon Kokan K. K., a leading Japanese steelmaker, at its Mizue Works near here.

The new system will make possible cost savings of approximately $833,000 a year, dramatically shorten delivery time, reduce inventory, and increase man hour efficiency at Mizue Works, the company said.

The operation is part of an NKK program to automate all its steelmaking facilities. Principal equipment includes large, medium, and small computers as well as on-line terminal devices.

Production Scheduling

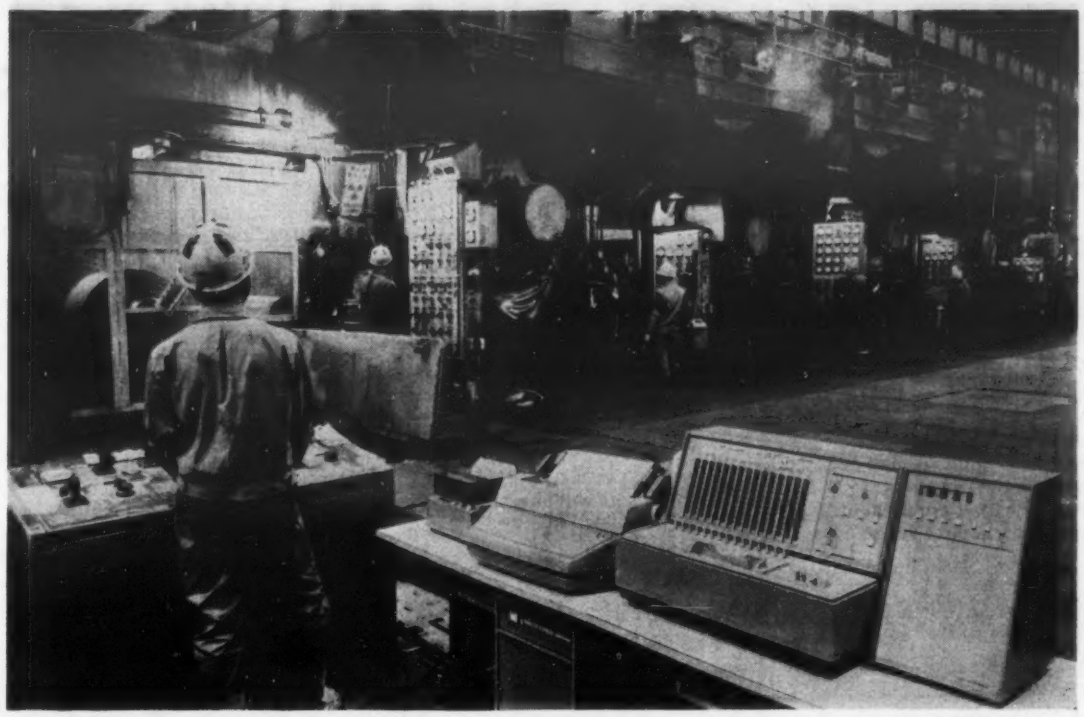
Orders received from customers are fed into an IBM 360/50 which then computes weekly Mizue production schedules. Based on weekly production capacity determined from general order data, production schedules, and processing status of individual orders, the computer then prepares processing schedules by calculating the various, complex technical aspects of processing.

Simultaneously, to achieve the most economical processing which embodies product quality, yield, and processing efficiency, the computer prepares processing instructions and optimum equipment utilization schedules.

Real-Time Control

Sixteen terminals, installed throughout the mill, are integrated in an on-line system with the computers in the Mizue Production Control Center. Data on coil cards which flows parallel to the processing line is transmitted to the control center on a real-time basis.

Data collected at the control center is processed by computers including GE-55, E4000 and others. These prepare data for overall processing controls and provide information on the processing status of individual orders. As a result, it is possible to determine any work flow imbalance among the processing points and to achieve early identification of any substandard material.



The data collector, right, is one of 16 units at key processing points on the sheet steel production line at the Mizue Works of Nippon Kokan.

Processing control is greatly improved by feedback of rescheduling and other instructions and by diversion of products and materials to other processing points to adjust for workload imbalance and to effect reclassification of materials and products as required. The system also improves customer service by accelerating accurate responses to order inquiries.

An IBM 360/20 processes information on product quality, production statistics, and other data, eliminating time consuming, manual calculations required for order entry and processing and status reports on individual orders.

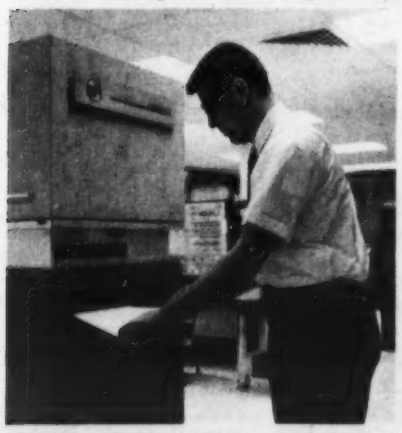
Donnelly Installs Fast CRT Typesetter

CHICAGO – A computer operated typesetting system which can produce complete pages in 10 seconds or less has been put into operation at R.R. Donnelley & Sons Co., which calls itself the world's largest commercial printer.

The new character generating system centers around an RCA Videocomp 832 electronic composing machine which sets type on film ready for plate making at 1000 or more characters a second.

"We have coined the term 'Electronic Graphics' to describe the merger of computer technology and typographical skills," said Charles W. Lake, Jr., president of Donnelley. "Our new system is the first of an advanced design and at present the only one of its kind 'on stream' in the world. It provides us with the ability to set type at computer speeds and has unique advantages for users with existing computer data banks. It is ideally suited to parts and price lists, directories, and other large volume typesetting requirements which are periodically updated and reissued."

"Since a computer file is required for input, we expect – with the present state of the art – to use electronic composition primarily for projects which can utilize existing data banks or which justify development of such a file. We anticipate that this new technology will provide increased markets for other Donnelley services including conventional composition," Lake said.



A completed page comes out of the character generator ready for plate making.

Early Projects

Typesetting for the September 1968 edition of Dun & Bradstreet's Reference Books, consisting of 2,400,000 separate listings, was generated by Donnelley's new system. These listings are used to make up and print 17 national and regional volumes for this edition. Subsequent editions of this bi-monthly reference guide will also be generated on the Videocomp.

In another application, the Official Airline Guide, previously reproduced from a computer printout, is now being composed on Donnelley's new electronic character generating system, utilizing OAG's existing computer data bank. The flexibility of type selection makes it possible to produce the same information in fewer pages. The ability to produce bold face headings and make other type selections also improves readibility of the finished product.

System Operation

The Videocomp operates by magnetic tape. Input tape is combined with coded graphic arts instructions which determine the form and arrangement of the page, size and style of type, spacing, and other aesthetic requirements.

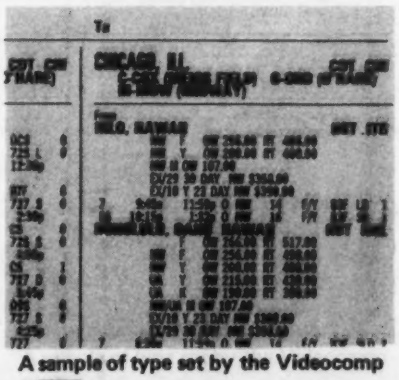
A selection of type sizes and styles is available. Different sizes and styles may be intermixed electronically, on the same line if desired. Type is generated in column form or as complete pages including running heads, folios, footnotes, and footlines.

The type is set in line lengths up to 9" and in sizes from 4 to 96 points. The characters can be altered electronically to slant, extend, condense, or form other variations as required by the text.

More than 1000 characters a second are produced at reproduction quality levels. Speeds up to 4000 characters a second can be generated at quality levels adequate for proofreading purposes.

The character generator works much like a television set.

The coded magnetic tape requests an individual letter in a specific size and style. The control computer interprets this request, determines the character location in memory and sends the proper electronic signals to the CRT to form the character. This image is then projected through a lens onto photographic film or paper.



A sample of type set by the Videocomp system.

Computers Help Search for Oil

SHREVEPORT, La. – Computers are helping researchers probe the bottom of the sea in a worldwide search for oil.

The computers are used by Western Geophysical Co. to produce cross sections of the earth's layers to help experts locate underwater oil deposits.

Western Geophysical, a division of Litton Industries, provides a complete oil exploration service to the international petroleum industry from offices in Shreveport, Los Angeles, Houston, London, England, and Milan, Italy.

Data used to produce these seismic sections is gathered by nearly a score of marine crews in Western's fleet. At sea, complex mechanical devices produce underwater sound waves which penetrate deeply into the ocean floor, bounce back, and are picked up by a cable containing sensing devices.

The reflected sounds are recorded on magnetic tape as a series of digits and later analyzed by the computers to determine the kind of earth layers below the sea. The cross sections are given to oil company geologists who decide where to drill.

Western's navy – the largest oceanographic fleet in the world – explores thousands of miles each month. Using a similar probing technique, the company's land crews cover thousands of additional miles.

25,000 Miles of Tape

"As a result of our land-sea explorations, we use enough magnetic recording tape to encircle the earth every nine months," said Carl H. Savit, vice president for research and development.

Later this year, Western Geophysical will install a new device – the IBM 2938 Array Processor. Western, which refers to the device as Sam (Seismic Array Manipulator), will then be able to "see" many more details of the rock layers under the earth and will speed up its whole electronic process.

"Sam will help us filter out many unwanted sounds recorded on the tape, such as the roar of wind and wave and the churning of the ships' propellers. We will then be able to provide our clients with more detailed charts of the earth beneath the bottom of the sea," Savit said.

Western uses six IBM 360/44s to process its data.

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System Maintains Personnel Records

By a CW Staff Writer

LOS ANGELES – A Cobol program currently running under IBM 360 DOS or OS and designed to automate the maintenance of personnel records is under test by Computer Sciences Corp. at a large Pacific Coast bank. The system, called the Personnel Management Information System (PMI), uses an "English" language shorthand such as "age GE 50, and salary GE 500, and salary LE 1000" to code requests for specific information. (The request quoted would obtain a list from the file of those who are 50 years old earning between $500 and $1000 per month.)

PMI maintains a Personnel Information Document, a single file which incorporates all of the key elements of an employee's history with a company. Whenever a change is made in an employee's status, such as a pay increase, the system automatically updates the employee's Personnel Information Document to reflect the change.

Security Precautions

Information considered confidential by management is automatically withheld from routine reports. A special request code known only to authorized managers must be used to obtain such confidential data.

PMI generates reports in the general areas of employee records, compensation, benefits, and manpower distribution. Specific reports include lists of benefits arranged by benefits and by employees, turnover, salary increase analysis, and compensation planning. A Position Authorization Controls Report lists job classes, indicating classes in which there are vacancies or manpower surpluses.

PMI is priced at $25,000.

Inventory Control System Spots Incipient Problems

Melvin Schneider, Martin-Brower president, shows off some of the firm's bags and containers.

By a CW Staff Writer

CHICAGO – A Honeywell software product designed to maintain inventory management has been running successfully here for the past nine months. Called Profit, it has come up to the expectations of the user, Martin-Brower, which supplies custom designed bags to major fast food franchisers across the nation from 10 regional warehouses. It has been able to handle a number of instances where the requirements for a given product varied 100% up and down from one week to the next, or even from day to day, particularly when weather changes occurred.

At Martin-Brower, each warehouse is responsible for the customers in its area and deals with each franchise outlet on an individual basis so that although there are comparatively few franchises involved, the effect is that there are many customers – currently about 10,000. The Profit system reviews previous demand for each item in the 5000 item inventory, estimates upcoming demand, reports on the status (flagging items that are on the critical list), and checks on the accuracy of previous forecasts.

Since the system was implemented in January, the most valuable part of the service has been found to be the early warning system.

"The computer says we'll need two million paper bags in June for a customer serviced by our Los Angeles warehouse," said Melvin Schneider, Martin-Brower president. "The bags are scheduled to be on hand when they are needed. But about half way through the month, the computer notes the demand is a lot higher than the forecast. Maybe there's a change in the weather that the computer didn't know about. So the computer throws up a warning asterisk. Now we know that the forecast is breaking down and if we stick with it we probably won't have enough bags. We check with the branch, find out about the weather change, and boost our order for that branch."

Sometimes the product demand defies reason; ice cream sales often dip sharply when the weather is hot. There are consistencies, too. Demand is more constant at the Los Angeles warehouse where the year-round weather is fairly uniform. On the other hand, the warehouse in Woodbridge, N.J. is subject to widely swinging demands. Shipments were very high this April, for example, when the East Coast basked under warm weather after a rainy March.

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Dominant Group at SJCC Represented Business DP

By a CW Staff Writer

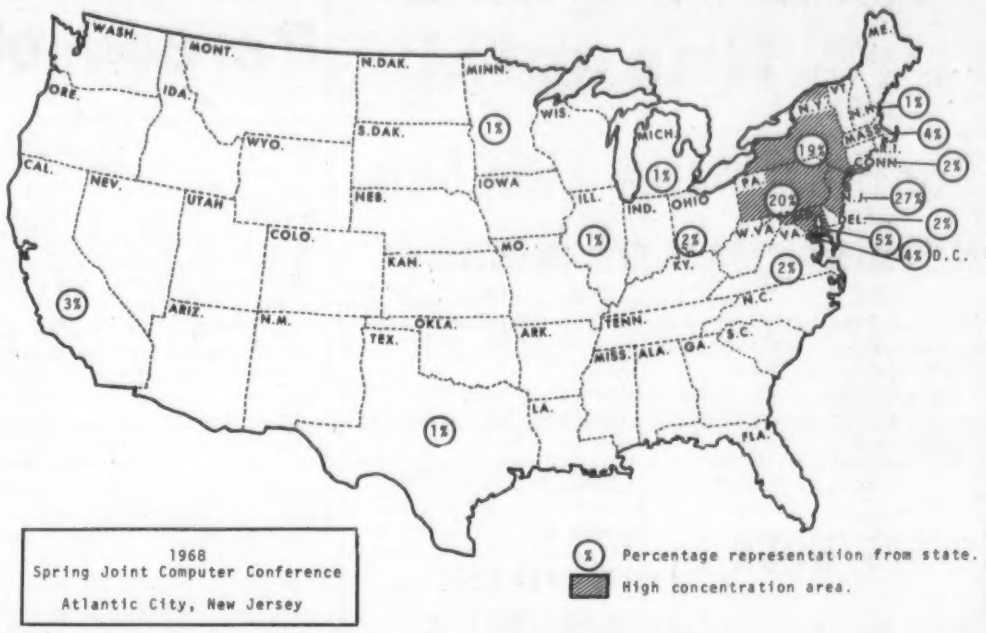
NEW YORK – A study of the 15,000 people who attended the Spring Joint Computer Conference at Atlantic City, N.J., this year has yielded some surprising results. For the first time it attracted more people in business data processing than in scientific operations. Percentage figures, taken from a mail survey, show that interest in business and scientific data processing was almost the exact reverse of that at previous Spring Joints, with 34% now business oriented, as against a previous 27%, and 27% scientific oriented, as against the previous 35%.

The change, which may have occurred primarily because of the increased number of visitors (14,000 as against 10,000 for the previous year), also shows in the average number of exhibits visited (19 after a steady increase from 11 in 1966). Even so, the average was not so high as for the normal show goer who, in 1968, is expected to visit 24 stands.

The attendees were mostly members of ACM or IEEE. ACM contributed 26% of the attendance, primarily from the Northeast.

An estimated 60% of the visitors came from New Jersey, New York, and Pennsylvania. Outside that vicinity, only California produced a reasonable representation (3%) of visitors (see map).

Not many of the attendees had been to any of the previous Spring or Fall Joints, and it was estimated that if the same exhibit had been used in the last four consecutive years, only about 30% of the audience would have seen it before. As in previous years, the main interest (82%) seemed to be in the peripheral area.



Geographical Distribution of visitors to the SJCC, based on a sample of 873.

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Boothe Settles Law Suit; Retains Use of Name

SAN FRANCISCO – Boothe Computer Corp. and its related companies have reached an agreement to continue using the Boothe name in return for an undisclosed consideration to be paid by Boothe to Greyhound Corp. in Chicago.

The agreement was part of an out of court settlement of a $10 million damage suit filed against Boothe by Greyhound. Full details were not disclosed.

The suit, filed in an Illinois state court last fall, charged D.P. Boothe, Jr., and others, with misconduct in trying to lure customers and employees away from Greyhound. The suit also sought to prevent the use of the "Boothe" name in the leasing business by the defendants.

Boothe, who once headed Greyhound's computer leasing operations, left Greyhound in July, 1967, to found Boothe Computer.

SEC to Start Hearings on Oct. 8 On Charges Against Merrill Lynch

WASHINGTON, D.C. – The Securities and Exchange Commission has set Oct. 8 as the date that it will start administrative proceedings on staff charges against Merrill Lynch, Pierce, Fenner & Smith Inc. and others. They are accused of violating federal securities laws by trading in Douglas Aircraft Corp. stock while in the possession of nonpublic information about declining earnings.

The firms and individuals involved have denied any wrongdoing.

The proceedings will start in New York with a prehearing briefing "to clarify and simplify issues by consent of the parties." The SEC said it will disclose "in reasonable detail the bases of its allegations and the nature of its proof" at the conference.

Amex Fact Booklet Is Published

NEW YORK – The American Stock Exchange has published a booklet entitled *Amex Databook* – the first comprehensive statistical profile of the exchange.

The 64 page reference work details the administrative and financial structure of the exchange and supplies detailed statistics on membership, market data services, commission rates, the stock list, and trading volume ranging back to the 1920s and 1930s. Thirty charts – especially prepared for the edition – illustrate key segments of the tables and text.

Copies of the booklet can be obtained from the exchange's Information Services Division, 86 Trinity Place, for $1 each.

New Registrations

BRANDON APPLIED SYSTEMS, INC., 30 E. 42nd St., New York, a company providing a variety of services to users of electronic data processing equipment, filed to register 104,759 common shares, to be offered for subscription by stockholders at the rate of one share for each four held. Proceeds, at a maximum of $15 per share, will be used for equipment and debt repayment. The underwriter is Gregory & Sons, 40 Wall St., New York.

DATASCAN, INC., 1111 Paulison Ave., Clifton, N.J., an electronic equipment and subassemblies manufacturer, filed to register 105,000 common shares, 80,000 to be offered by the company and 25,000 by selling stockholders. Proceeds, at a maximum of $10 per share, to be used for debt repayment, expansion, and working capital. The underwriter is New York Securities Co., 52 Wall St., New York,

DEARBORN COMPUTER CORP., 100 W. Monroe St., Chicago, Ill., a computer lessor, filed to register $12.5 million of convertible subordinated debentures due in 1988 and 175,624 common shares, 50,000 to be offered by the company and 125,624 by selling stockholders. Proceeds, with the prices to be set, to be used for equipment and possible acquisitions. The underwriters are Ladenburg, Thalmann & Co., 25 Broad St., New York, N.Y., and Oppenheimer & Co., 5 Hanover Square, New York,

FOTO-MEM, INC., 2 Mercer Rd., Natick, Mass., a photo-optical systems manufacturer, filed to register 150,000 common shares. Proceeds, at $8 per share, to be used for working capital. No underwriter.

LMC DATA, INC., 116 E. 27th St., New York, a used data processing equipment lessor, filed to register $4 million of convertible subordinated debentures due in 1983. Proceeds, at $500 per debenture, are to be used for expansion, debt repayment, and equipment. The underwriter is Myron A. Lomasney & Co., 67 Broad St., New York.

SCIENTIFIC CONTROL CORP., 14008 Distribution Way, Dallas, a manufacturer of general purpose computers and data processing equipment, filed to register 382,000 common shares, 182,000 to be offered by the company and 200,000 by selling stockholders. Proceeds, with the price to be set, to be used for working capital. The underwriters are H.L. Federman & Co., 50 Broadway, New York, and Kleiner, Bell & Co., 9756 Wilshire Blvd., Beverly Hills.

Computing & Software Inc. To Buy Manufacturing Unit

LOS ANGELES – Computing & Software Inc. has announced its move into the computer equipment manufacturing field with the signing of a definitive agreement to purchase Troy Computer Products Inc. in Santa Ana for stock valued at about $4 million.

Troy manufactures data terminals, notably high speed printers, and allied products. Computing & Software is involved in the management of computer centers, computer programming, and data processing personnel training.

Computing & Software also announced net income for the nine fiscal months ended July 31 for itself and its subsidiaries was $1,109,000 (86 cents a share), up 32% from $839,000 (67 cents a share) for the comparable period a year ago. The 10% federal income tax surcharge reduced earnings by $72,000 (6 cents a share), the company said.

Total revenues for the period were $23,812,000, compared with $19,420,000 (restated to include companies acquired subsequently on a pooling of interests basis) for the preceding period, it said.

The company also said that early in the current fiscal quarter it disposed of its portion of business engaged in consumer electronic servicing in order to concentrate its efforts on computer related operations and information processing.

Leasco Tender Bid Lands Most of Reliance's Stock

GREAT NECK, N.Y. – Leasco Data Processing Equipment Corp. has received "more than 90%" of the stock of Reliance Insurance Co. in Philadelphia in its tender bid that expires Sept. 30, according to Leasco's Frederick Jackson.

Jackson refused to give *Computerworld* further details.

The tender offer had originally been scheduled to end Sept. 10, but was extended for 20 days. Leasco said that it had obtained "substantially more than 51%" of Reliance's outstanding common stock before Sept. 10.

Reliance management originally opposed the planned takeover, but later dropped open opposition in favor of taking no public stand. However, Reliance refused to provide any information about itself for a Leasco prospectus.

Acquisitions

Cornell Aeronautical Lab Sold to EDP Technology

ITHACA, N.Y. – Cornell University has agreed to sell Cornell Aeronautical Laboratory, its applied research center in Buffalo, to EDP Technology, Inc. in Washington, D.C., for $25 million.

Cornell said that the laboratory – with a staff of 1600 scientists, engineers, and support personnel – has contracts exceeding $32 million a year in aeronautics, electronics, and applied sciences for government and industry.

Leasco Plans to Acquire Information Development

GREAT NECK, N.Y. – Leasco Data Processing Equipment Corp. has reached an agreement to acquire the assets of Information Development Co., a Los Angeles, Calif., headquartered computer software company, for 20,000 shares of Leasco common stock.

IDC does work relating to the general and special purpose needs of the small computer field.

Tentative Accord Reached On Two Brandon Purchases

NEW YORK – Brandon Applied Sciences has agreed in principal to purchase Federated Printing Co., Inc. and Federated Manufacturing Corp., both also located here. Terms were not disclosed.

Management Data Centers Buys 2 Los Angeles Firms

DALLAS – Management Data Centers, Inc., a data processing and consulting firm, has announced two acquisitions in Los Angeles. Terms were not disclosed for either.

One acquisition involved Action On-Line, a company specializing in real-time on-line systems for the distribution industries. The company will continue to operate under its own name without change in management, MDC said.

The other purchase involved Computab, Inc., a general line computing organization with specialties for medical clinics and mortgage companies

Coburn Corp. To Acquire Time Sharing Services

ROCKVILLE CENTRE, N.Y. – Coburn Corp. of America has agreed to acquire all assets, subject to liabilities, of Time Sharing Services, Inc. in Beverly Hills, Calif., for an undisclosed amount of Coburn common stock.

Time Sharing Services will become an operating unit of Computer Methods Corp., a Coburn subsidiary, the announcement said.

Datamation Services Plans To Buy W.R. Simmons

NEW YORK – Datamation Services, Inc. has agreed in principal to acquire W.R. Simmons & Associates Research Inc., a media research consulting firm, for about 150,000 shares of common stock valued at about $5 million.

The transaction is subject to the approval of the Datamation board and the completion of satisfactory audits, Datamation said.

Microform Data Systems Buys MicroVue System

CUPERTINO, Calif. – Microform Data Systems, Inc. has purchased the patents, data, and related facilities comprising the MicroVue System from the Republic Aviation Division of Fairchild Hiller Corp.

In addition to producing and marketing MicroVue ultrafiche, capable of reproducing more than 10,000 standard size pages of printed material and graphics on a single 4" x 6" ultrafiche film card, Microform plans to manufacture and market a family of random access readers that can select and display full size from a cartridge of ultrafiche any one of 200,000 pages.

NN Corp. Buys Executive Computer Leasing Inc.

MILWAUKEE, Wis. – NN Corp. has acquired Executive Computer Leasing Inc. in Oakbrook, Ill., for an undisclosed amount of cash.

NN is a holding company formed by Northwestern National Insurance Co. ECL is a data processing consulting firm.

Spear Merger Completed

RUTHERFORD, N.J. – Becton, Dickinson and Co. has announced the completion of the acquisition of Spear, Inc. in Waltham, Mass. Terms were not disclosed.

Informatics Plans to Buy Computing Technology Inc.

SHERMAN OAKS, Calif. – Informatics Inc. has agreed in principal to acquire Computing Technology Inc. in Paramus, N.J., for 3000 shares of Informatics stock. The merger is subject to approval by the boards of both companies, CTI stockholders, and regulatory agencies.

CTI is engaged primarily in non-government computer software work.

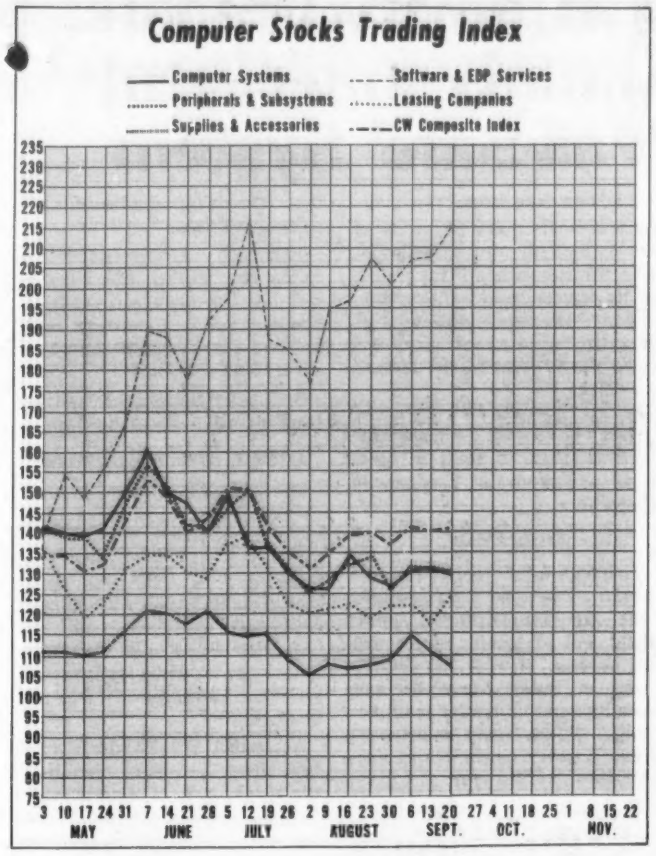
Earnings Reports

DATRONIC RENTAL

CHICAGO – Datronic Rental Corp. has announced that net income for the fiscal year ended June 30 was up 149% to $173,289 (17 cents a share) on revenues up 265% to $1,404,873.

OPTICAL SCANNING

NEWTOWN, Pa. – Optical Scanning Corp. has reported gross revenues of $5,261,000, up 111%, and earnings of $583,000 ($1.12 a share), up 202%, for the fiscal year ended June 30.


Computer Stocks Trading Index
Computer Systems
Peripherals & Subsystems
Supplies & Accessories
Software & EDP Services
Leasing Companies
CW Composite Index
235 230 225 220 215 210 205 200 195 190 185 180 175 170 165 160 155 150 145 140 135 130 125 120 115 110 105 100 95 90 85 80 75
3 10 17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22
MAY JUNE JULY AUGUST SEPT. OCT. NOV.

Composite Up, But Manufacturing Off

The *Computerworld* Composite Stock Index rose a point to 141 for the week ended Sept. 20 as the stock market reversed a one week decline to close up.

The Dow-Jones industrial average closed at 924.42, up 7.21 points (0.8%); the Standard and Poor's industrial average, 110.94, up 0.96 (0.87%); the New York Stock Exchange composite average, 57.03, up 0.53 (0.94%); the American Stock Exchange price index, $29.96, up 3l cents (0.1%); and the N.Q.B. over-the-counter industrial average, 414.28, up 2.94 (0.71%).

Volume for the week on the NYSE was 59,311,130 shares, up from 51,045,030 shares the previous week. Volume on the AMSE was 28,665,905 shares, up from 25,400,015.

No *Computerworld* listed stocks were on the NYSE's 20 most active list.

8 New Highs

Eight *Computerworld* listed stocks closed at new highs for the year. None closed at new lows.

Burroughs closed at 232, up 5-5/8 (2.48%), for a second consecutive high; Wabash Magnetics, 23-1/8, up 2-1/4 (10.77%); Brandon Applied Sciences, 21, up 3 (16.61%); Computer Exchange, 23, up 2 (9.52%); Leasco, 110, up 18 (19.56%); and System Capital Corp., 46-1/2, up 7 (17.72%).

Among the *Computerworld* listed stocks, 50 issues closed up, 43 closed down, and six remained unchanged. The previous week, 39 were up, 49 down, and seven unchanged.

Overall on the NYSE, 977 issues advanced, 595 declined, and 123 remained the same, versus the previous week's 803 gains, 729 declines, and 142 unchanged. New highs were reached by 232 issues and 21 dropped to new lows, as against the previous week's score of 176 new highs and 29 new lows.

CW Indexes Mixed

The five *Computerworld* sector indexes showed mixed activity again, with two up and three down.

The Computer System index reversed a two week gaining period to close at 129, down 2 points (1.53%). The sector has been generally declining, with occasional brief upward movements, since a high for the year May 7.

The Peripherals & Subsystems index also reversed a brief upward trend, closing at 130, down 1 point (0.8%). The index has been generally mirroring the Computer Systems index.

Closing down 4 points (3.7%) at 108 was the Supplies & Accessories index.

The Software & EDP Services index closed up 7 points (3.34%) at 215.

The Leasing index was up 6 points (5%) to 124.

Commentary

According to some sources, the Dow-Jones industrial average, which closed slightly under the 1968 high of 924.98 set Sept. 9, might reverse a historical trend of September declines and close up.

The market has a good head of steam on, and the Commerce Department has recently announced that new factory orders for durable goods rose in August and predicted a rise in the gross national product for the current quarter.

In addition, personal income advanced in August and credit conditions have been generally easing, pumping more money into the economy.

COMPUTER STOCKS: TRADING SUMMARY

WEEK ENDED SEPT. 27, 1968

EXCHANGE	COMPUTER SYSTEMS	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	* Burroughs	163 3/8	232—157	232 1/2	+ 5 5/8	+ 2.48	+ 42.00
NYSE	Collins Radio	67 3/4	110— 54	62 1/2	+ 1 3/8	+ 2.24	— 7.75
NYSE	* Control Data	101 1/2	174— 95	128	— 7	— 5.19	+ 26.11
AMSE	* Digital Equipment	102	160— 95	128 1/2	+ 3 1/2	+ 2.80	+ 25.90
NYSE	General Electric	87 1/4	100— 81	86 1/8	— 1/8	— 0.15	— 1.29
NYSE	Hewlett-Packard	60	91— 59	78 7/8	— 3/8	— 0.49	+ 31.45
NYSE	* Honeywell	93 1/8	144— 89	121	— 1	— 0.82	+ 29.92
NYSE	* IBM	288 1/2	375—280	331	— 6 1/2	— 1.96	+ 14.73
NYSE	* National Cash Register	103 7/8	153— 90	135 5/8	+ 1 7/8	+ 1.40	+ 30.56
NYSE	RCA	46 7/8	55— 44	47 7/8	— 3/4	— 1.90	+ 2.13
NYSE	Raytheon	39 1/8	53— 34	44 1/2	+ 4 1/4	+ 10.55	+ 13.73
OTC	* Scientific Controls Corp.	22 1/2	66— 20	40	— 1	— 2.44	+ 77.70
NYSE	* Scientific Data	78 3/4	114— 72	85 1/4	— 4 3/8	— 4.90	+ 8.25
NYSE	* Sperry Rand	45	63— 42	45 1/4	— 1 1/8	— 2.70	+ 0.55
AMSE	* Systems Engineering Labs.	22 1/2	39— 20	29 3/8	— 1 7/8	— 6.00	+ 30.55

EXCHANGE	PERIPHERALS & SUBSYSTEMS	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	Addressograph-Multigraph	58 3/8	91— 52	85 7/8	+ 1/4	+ 0.44	+ 47.10
OTC	Alphanumeric	21	85— 45	57	— 3	— 9.00	+ 171.00
NYSE	Ampex	29	37— 26	34 5/8	+ 1	+ 2.91	+ 19.40
OTC	Bolt, Beranek & Newman, Inc.	17 1/4	27— 15	17	— 3 1/4	— 16.09	— 1.45
NYSE	Bunker-Ramo	13 1/2	20— 12	16 7/8	— 3/8	— 2.70	+ 25.00
AMSE	* Calcomp	32 1/8	50— 27	39 1/2	+ 1	+ 2.54	+ 22.91
OTC	Cognitronics	24 1/2	49— 20	38	— 4	— 9.70	+ 55.10
OTC	Computer Equipment	12	17— 10	17 1/4	+ 1 3/4	+ 11.29	+ 43.75
OTC	* Data Products	15 1/4	23— 13	17 3/8	+ 1/8	+ 0.72	+ 13.93
OTC	* Digitronics	19 1/4	27— 16	19 1/2	— 1/2	— 2.50	+ 1.30
OTC	* Electronic Memories	39	57— 32	43	+ 2 1/4	+ 5.52	+ 10.26
OTC	* Fabri-Tek	10	20— 9	16 1/8	+ 1/8	+ 0.78	+ 61.25
OTC	Gerber Scientific	34	71— 28	58	— 1 1/2	— 2.53	+ 70.59
OTC	Information Displays	12 1/2	26— 10	21	+ 1/2	+ 2.43	+ 67.10
AMSE	Milgo Electronics	16 7/8	52— 14	35	— 1 3/8	— 3.79	+ 107.40
AMSE	* Mohawk Data Sciences	57 1/2	108— 54	74 1/2	— 11	— 12.87	+ 29.52
OTC	* Optical Scanning Corp.	74	138— 71	103	+ 2	+ 1.98	+ 39.19
OTC	Photon	18	42— 16	31 3/4	+ 1	+ 3.25	+ 76.31
AMSE	* Potter Instrument	25 5/8	38— 20	29 3/8	+ 2 1/2	+ 9.30	+ 14.63
OTC	* Recognition Equipment Corp.	40 1/4	99— 38	84	— 2	— 2.38	+ 108.64
AMSE	Rixon Electronics	16	29— 14	24 1/2	+ 1/8	+ 0.51	+ 53.12
NYSE	Sanders	46 1/8	66— 42	52	+ 1 7/8	+ 3.74	+ 12.74
OTC	Scan-Data	47	155— 53	65	——	——	+ 38.28
OTC	* Tally Corp.	40 1/2	51— 35	41	— 2	— 4.65	+ 1.23
NYSE	Xerox	242 1/4	321—229	296 1/4	+ 6 3/4	+ 2.33	+ 22.29

EXCHANGE	SUPPLIES & ACCESSORIES	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK % CHANGE	%CHANGE FROM BASE
OTC	* Acme Visible	48 1/2	64— 37	44	+ 1	+ 2.31	— 9.29
NYSE	Adams-Millis	20 1/2	32— 19	21 3/8	+ 2 1/8	+ 11.04	+ 4.27
OTC	* Baltimore Business Forms	13 5/8	21— 13	20	— 1/4	— 1.30	+ 46.79
AMSE	* Barry Wright	27	44— 21	30	— 7/8	— 2.86	+ 11.11
OTC	Data Documents	31 1/4	40— 26	35 1/2	— 3/4	— 2.07	+ 13.60
OTC	* Ennis Business Forms	27 1/4	38— 26	33	——	——	+ 21.10
NYSE	* 3M Company	84 1/8	119— 81	103 7/8	+ 3 1/4	+ 3.22	+ 23.47
NYSE	* Memorex	58	80— 48	75 7/8	+ 1/8	+ 0.16	+ 3.08
OTC	* Moore Business Forms	27 1/4	32— 25	28 1/8	— 3/8	— 1.32	+ 3.21
NYSE	Nashua Corp.	57 1/4	76— 47	73 3/4	— 1 1/4	— 1.67	+ 28.82
OTC	Reynolds & Reynolds	31 1/4	56— 30	48 1/2	+ 2	+ 4.30	+ 55.12
OTC	* Standard Register	34 1/2	35— 24	27 3/4	— 1/4	— 0.90	— 19.57
NYSE	* Uarco	37 3/4	44— 30	34	— 1/2	— 1.45	— 9.94
AMSE	Wabash Magnetics	14 1/4	23— 13	23 1/8	+ 2 1/4	+ 10.77	+ 62.28
OTC	* Wallace Business Forms	25 3/4	36— 24	29 1/2	— 1/2	— 1.69	+ 14.56

EXCHANGE	SOFTWARE & EDP SERVICES	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	Advanced Computer Techniques	7 1/2	25— 7	14 1/4	— 2	— 12.40	+ 90.00
OTC	* Applied Data Research	17	33— 14	23 1/2	— 1 1/2	— 6.00	+ 38.23
OTC	* Aries	15 1/2	124— 15	15 1/2	— 1 1/2	— 8.82	——
AMSE	Automatic Data Processing	47	60— 42	53 1/8	— 2 5/8	— 4.78	+ 13.03
OTC	Automation Sciences	4	19— 4	14 1/2	+ 1/4	+ 1.75	+ 262.50
OTC	* Brandon Applied Systems	4 1/2	21— 3	21	+ 3	+ 16.61	+ 366.60
AMSE	Computer Applications	22 7/8	43— 20	23 3/4	— 3/8	— 1.60	+ 3.82
OTC	Computer Environments	5	13— 7	13 1/2	——	——	+ 169.60
OTC	Computer Network	30	62— 24	62	+ 3	+ 5.08	+ 106.66
AMSE	* Computer Sciences	40	64— 36	50 3/4	+ 6 1/2	+ 14.68	+ 26.87
OTC	* Computer Usage	39	62— 28	31	— 1	— 3.13	— 20.52
AMSE	* Computing & Software	36 1/2	61— 36	56 1/8	+ 2 5/8	+ 4.91	+ 53.76
OTC	Datamation Services	12 1/2	39— 10	39	+ 6	+ 18.18	+ 211.60
OTC	* Digitek	12 1/2	20— 9	11 1/2	——	——	— 8.00
AMSE	Electronic Computer Prog. Inst.	38 3/8	52— 26	27 3/4	— 3/8	— 1.34	— 27.69
OTC	* Informatics	35	68— 32	55	— 5 1/2	— 9.09	+ 57.14
OTC	Matrix Corp.	21	28— 14	19 1/2	+ 2 1/2	+ 14.71	— 7.15
OTC	* National Computer Analysts	11 1/2	69— 8	68	+ 2	+ 3.03	+ 491.30
AMSE	Planning Research	31	45— 28	42	+ 2	+ 5.20	+ 35.48
OTC	Programming & Systems	**	**	14	— 1/2	— 3.46	**
OTC	Software Systems	9	15— 8	9 1/4	——	——	+ 2.78
OTC	TBS Computing Centers, Inc.	20 1/2	22— 12	13	— 3/4	— 5.46	— 36.59
OTC	United Data Centers	**	**	11	— 1/2	— 4.35	**
OTC	University Computing	63	158— 57	156	——	——	+ 147.62
OTC	URS Systems Corp.	**	**	**	**	**	**
OTC	U.S. Time-Sharing	**	**	12 1/2	+ 2 1/4	+ 21.95	**

EXCHANGE	LEASING COMPANIES	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	Boothe Computer	18	**	51	+ 5	+ 10.86	+ 183.31
OTC	Chandler Leasing	19 1/4	**	**	**	**	**
OTC	Computer Exchange	4 1/4	23— 4	23	+ 2	+ 9.52	+ 441.00
AMSE	* Computer Leasing	25 1/8	36— 21	26 3/8	+ 5/8	+ 2.43	+ 4.97
OTC	* Cyber-Tronics	12 1/4	19— 11	13	+ 3/4	+ 6.12	+ 6.12
AMSE	* Data Proc. Financial & General	106 5/8	184— 88	106 3/8	+ 9 1/4	+ 9.52	— 1.00
OTC	Datronic Rental	12 1/2	17— 8	9 5/8	+ 1	+ 11.53	— 23.01
OTC	Dearborn Computer	20	59— 18	45	— 1 1/2	— 3.90	+ 124.99
OTC	* DPA, Inc.	13 1/4	19— 12	17 7/8	+ 3/4	+ 4.37	+ 34.90
AMSE	* Greyhound Computer	28 3/4	43— 27	30 1/2	+ 2 3/8	+ 7.55	+ 6.08
AMSE	Granite Equipment Leasing	28 1/8	69— 36	49 3/8	+ 2 5/8	+ 5.61	+ 75.53
AMSE	* Leasco	49	110— 41	110	+ 18	+ 19.56	+ 124.43
OTC	Lectro Computer Leasing	5	14— 5	11	+ 2	+ 22.22	+ 120.00
AMSE	* Levin-Townsend Computer Corp.	30 3/4	63— 27	51 1/4	— 1	— 2.00	+ 66.40
OTC	* LMC Data, Inc.	10 1/2	16— 7	8 1/2	— 3/4	— 8.50	— 19.05
OTC	* Management Assistance	10 7/8	16— 10	10 3/4	— 5/8	— 5.50	— 1.20
AMSE	National Equip. Rental	41 5/8	53— 25	39	+ 5 3/4	+ 17.29	— 6.31
AMSE	* Randolph Computer Corp.	38	64— 35	46 7/8	+ 4 1/2	+ 10.61	+ 23.35
OTC	System Capital Corp.	10 1/2	46— 10	46 1/2	+ 7	+ 17.72	+ 342.82
AMSE	U.S. Leasing	10 7/8	21— 10	21	+ 1/8	+ 0.60	+ 93.10

*Companies included in Computerworld's stock trading index for each sector.

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Who Says People Don't Read Classified Ads?

Taxpayers Demand County Implement 'Fail-Safe' System

(Continued from Page 1)

argue strongly that it is the user of the equipment, not the vendor, who is responsible for the results of its operation or malfunction; and that the user should provide adequate fail-safe backup systems to ensure the proper operation of the whole.

In this they also cite the use of other advanced technologies, such as radar, as being in some ways analogous to the use of computers.

Errors Persist

The computer errors involved appear to have been quite persistent. Mrs. Janet Lawson apparently had to receive emergency aid because of what the Department of Public Social Services described as "computer malfunctions." These lasted in her case from January until it was corrected in May this year.

In some cases it appears that attempts to correct errors themselves misfired. Mrs. Stearns, a divorcee whose husband is paying $80 a month towards her support, was involved in such a case where a correction for a "computer malfunction" which occurred on April 1 was attempted by feeding in a fictitious "termination of aid" notice for April 30 and a "reopening of aid" note for May 1. The procedure apparently did not work and the May check was not issued. An inquiry was unable to determine quite why the procedure had not worked. Mrs. Stearns, however, did not have it happen month after month because she obtained employment later in May.

Errors Cause Two Moves

One of the worst cases cited by the plaintiffs concerned a Mrs. Wilda J. Gosney, who with her three children was evicted last November from her house for nonpayment of rent. At the time there was allegedly over $513.50 due to her, which had accrued since the beginning of September. The reason it had not been paid, according to her case worker, was that "the new computer did not pick up your case."

Later the computer, according to the case worker, also failed to pick up her change of address, and as a result it was not until January that a payment due on Sept. 15 reached her.

Even after this was cleared up, further problems were in store.

Prompt Payment Mandatory?

The legal basis for the suit lies in the assertion that once a welfare recipient has been accepted for aid, then aid must be paid promptly. In California, great stress is laid on welfare recipients budgeting properly, and the plaintiffs point out that they never know when checks will arrive in a condition that they can be cashed.

According to the claim, for the first three months of operations the system was in error between 65% and 80% of the time. After the three month period the error percentage, they say, dropped to between 10% and 25% of the time, where it now is.

W.H. Gisbrecht, financial coordinator of the Administrative Data Processing Department of the University of Southern California, gave his opinion that such an error rate in checks actually mailed is so high as virtually to compel an inference that the computerized system has been improperly, incompetently, or negligently implemented.

He said the university's computer system had an error rate of only 0.1%.

Meetings

DPMA Meeting
Rte 128 Chapter
Pillar House, Routes 128 & 16, Newton, Mass.
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Social 5:30 – Dinner 6:30
2 workshops: Computer-written Letters & Educating non-EDP Management
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County of Fresno, Honeywell H-1200 Installation. Contact Mr. Forden, Personnel Department, Room 102, Courthouse, Fresno, California 93721, phone (209) 268-6011, extension 533.

Conference Set On Management, Technical Topics

Special to Computerworld

MANCHESTER, N.H. – A Friday afternoon and Saturday morning conference covering both managerial and technical areas is being sponsored here Oct. 4-5 by DPMA Division 14 for members and nonmembers.

The keynote speaker, Roderick R. Richards, is expected to urge more recognition of the difference between data processing functions and systems and procedures operations. Richards preaches the philosophy of what he calls "the separation of Church and State" in the data processing field and feels that its functions are separate from those of the systems area.

Management

General management problems both upwards and downwards in the corporation will come under scrutiny at the conference: upwards when Prof. Leon Liebman of the MIT Sloan School of Management talks on the communication problem between management and the data processing function, and downwards when Malcolm Smith of Honeywell talks about performance evaluation for programmers.

Checkless Society

The conference also will include a number of technical items, with discussions on data collection, data communications, and optical character recognition. Dale Reisted, formerly automation director for the American Bankers Association, will discuss the Checkless Society – and whether it is a promise or a threat.

Sandwiched between the sessions on Friday evening will be some entertainment including one act which has been making a national tour of the Playboy clubs.

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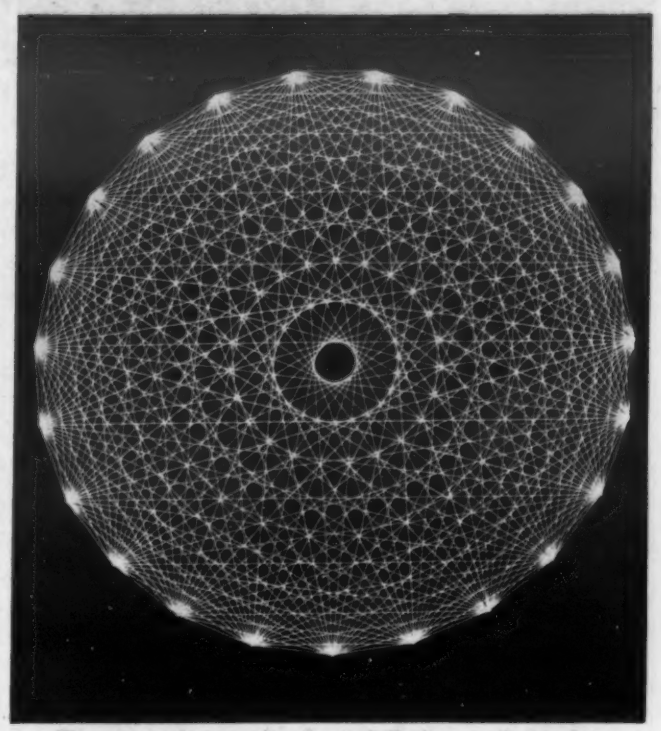
CRT Controller Has Digital Computer

NEW YORK – Univac has announced an "intelligent" graphic terminal and controller designed to reduce the load on the central processor during use. The controller, Model 1557, contains a small computer with an 8 or 16K memory of 18 bit words which helps local operations on up to three Model 1558 terminals. Backing up the controller when necessary is another computer, usually a Univac 1108, operating in multiprogramming mode. Other systems can be used, according to Univac. The 1557/1558 combination markets at $195,000 to $350,000, depending on the number of terminals and the options on the controller. Delivery of the hardware is approximately nine months. The first units already have been shipped.



These two photographs of actual displays on the new Univac graphic system illustrate the clarity and detail provided by the new system. The map of Florida, because of detail in the outline, required as much storage as the design.

1024 X 1024 Grid

The amount of information available on the screen is stressed by Univac. The unit has a 1024 by 1024 grid and provides two intensity levels so that background and foreground information can be differentiated. Lines can be automatically dashed, or displayed with an intensified end point for easier reading. The dashed line can be used for such things as showing which lines cannot be seen under normal circumstances when the image of a three dimensional object is rotated.

Three Dimensional Uses

The use of displays for viewing three dimensional objects was stressed by Univac President R.E. McDonald.

"The day is envisaged when a contractor is likely to have a visual device at the construction site connected to a central computer programmed with house designs," he said. "Then an architect's customer could go to a construction site and see various computer-produced building designs as if they were already on the site."

"We believe that shortly 25% of all computers will have some form of graphic output," he added.

Data Bank Connections

One particular reason why graphic output shortly would be added to computers, he suggested, was because it was intrinsically tied to management information systems and the data banks which are expected to proliferate in the next few years. The graphic display, he pointed out, is the easiest way such masses of information can be comprehended.

Instead of a lengthy readout of printed information, the display unit presents the data in analyzed form as a chart or graph. The design can be changed with a light pen and the whole process changed again.

Software

The software prepares programs both for the master computer and for the controller computer. The controller computer has an unusually fast 600 nanosecond cycle. It has 48 instruction codes and an execution time estimated at 1.2 microseconds per instruction. Multiply and divide instructions are handled by subroutines. The software in the controller normally requires 6K for buffering displays and connecting with the central computer system, leaving the remainder for local programs.

Vector Storage

Data for the screen is held in either long vector form (using two words per line of any length), or short vector form (one word per line for up to 63 units). It can be handled either by the use of absolute addresses or incrementally from the end position of the previous vector.

Digital Deflection System

Technically, the main advantage of the new system is in its use of direct digital deflection techniques. In contrast to the typical analog system displays currently in use, the digital deflective technique produces displays of superior characteristics in terms of speed, resolution and accuracy.

Univac says that all digital techniques in the 1557/1558 system enable speed and accuracies, in excess of what has been available to date, to be achieved. This capability is high enough to design integrated circuits and detailed drawings of complex mechanical parts. Other suitable applications would be automotive design, architectural drawings, mathematical models, and drawings of animated cartoons on-line.

By using a digital technique, the process of converting digital inputs into analog signals and then amplifying them to high current levels is eliminated. Instead, the Univac digital deflection system permits a digital representation to drive the deflection system directly, eliminating the differential amplifiers and feedback loops and their attendant adjustments.

The terminal is equipped with a keyboard containing standard alphanumeric and 40 function keys plus a light pen.

The new graphic system can be used for designing integrated circuits, as above, and other complex parts, according to Univac.

Complaints Increase 22%

BBB Criticizes Computer Billing Systems

By a CW Staff Writer

NEW YORK – A 22% increase in customer complaints involving incorrect billing or crediting of accounts ascribed primarily "to careless clerical help or start-up problems accompanying the installation of new and complex EDP systems" has been reported by the Better Business Bureau of Metropolitan New York, Inc. in its fourth quarterly study on why customers complain.

Analysis of 10,011 letters received over a three month period showed that the category contained 6% of all complaints. The report covered only the area served by the New York bureau.

However, bureau officials could not break down the figures for *Computerworld* to show what percentage of the complaints could actually be ascribed to computer start-up problems, or even to define how long the start-up period was.

Typical Complaint

Typical of complaints received by the bureau is a letter from a man in Lilliwaup, Wash., who is incensed by what he believes to be a deliberate fraud: double billings.

Sending copies of letters written to two large credit card companies – one in Washington and the other here – which apparently honor charges made by the other's card holders, the writer explained that both companies were continuing to bill him for a luncheon a year ago although he had promptly paid the first bill sent to him. To make matters worse, he said, both companies keep adding interest and service charges to the bills.

This is not the first time that he has run into troubles with computers, he wrote, adding that he has had similar problems with two large hotels and a large retail company. To him, it is a case of fraud.

The Better Business Bureau feels that it is not the double billing and repeated billing that has aroused his ire, but the fact that he has been unable to get a sensible answer to his letters.

BBB Answers

"Until the recipient's guilt of intent [to defraud] is proven, . . . [companies] should acknowledge to at least some degree that the error just possibly may be on the part of the company and that the company is as eager to get the right answer to the problem as the recipient," the bureau advised its members.

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